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Safety and Comforts of Railroad Traveling.

With regard to safety, our railroads are very far behind those of England, but with regard to comfort, we are rather ahead, especially in the arrangements of our carriages, which are of superior construction. But neither in safety nor comfort can our railroads or those of England compare with those of Prussia.—During the past year not a single life was lost in Prussia by any neglect on the part of those connected with their management, and only two lives were lost altogether.

A writer in the last number of *Blackwood's Magazine* describes the railroad management on the continent of Europe as something worthy of England to copy, and he asserts that the first class cars on English railways—provided for the nobility, who can pay big prices—are inferior to the common cars of Prussia. After all, there are some things in despotic countries worthy of imitation, and this is assuredly the case in railroad management. Whenever a good example is set us, by whom, or in whatever country, it is wise to profit by it. Our railroads are more safe than they were a few years ago; still there is great room for improvement. As yet, the life of a republican citizen is apparently esteemed of but little value by our public carriers.

Experiments with Cast Iron.

The War Department of the British government is about to institute a series of experiments with cast-iron, embracing the following inquiries:—Chemical analysis, specific gravity, tenacity, tension, transverse strain, compressibility, impact, and elasticity. The Department wishes to procure cast-iron of such a quality as will best suit the purposes of gun casting, and these experiments will be made with every variety of strong cast-iron that can be procured. Iron masters willing to submit their pig iron to such an investigation are invited to send samples to Woolwich, to be tested. This, we think, is an excellent method to discover and obtain the best of pig iron. The experiments are to be tabulated and published.

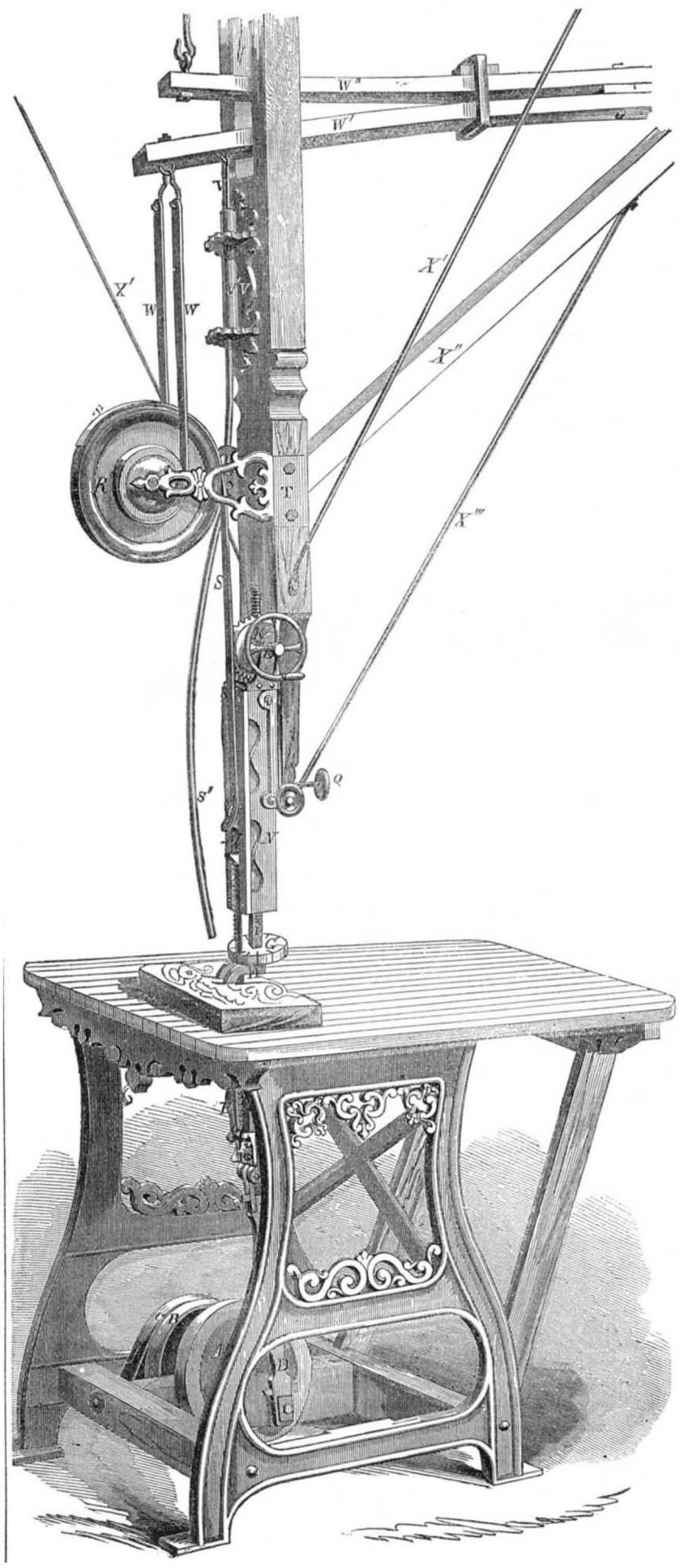
Importation of Telegraph Cables.

Two Submarine Telegraph Cables lately arrived in this city from Southampton, Eng. One of them is five miles long, five-eighths of an inch in diameter, and weighs eight and a half tuns. It is of the simplest form of cable, with three conductors, insulated by gutta percha. This is to connect Cape Cod and Martha's Vineyard. The other cable is half a mile in length and three inches in diameter. It has five conducting wires, covered and bound together with wires, insulated by gutta percha. It is to cross the Penobscot river, Maine.

The Line of Perpetual Frost.

The heat does not ascend as we rise above the earth nearer to the sun, but decreases rapidly until beyond the regions of the atmosphere, in void, it is estimated that the cold is about 70° below zero. The line of perpetual frost at the equator is 15,000 feet altitude; at 13,000 between the tropics; and from 9,000 to 4,000 feet between the latitudes of 40° and 59°.

IMPROVEMENT IN SCROLL SAWS.



Improved Scroll Saws.

The accompanying engraving illustrates an invention for which Letters Patent were granted to Mr. Lysander Wright, on the 2nd of Jan. 1855. Power is transmitted through wheels and pulley, A B C, to the pitman, D, the upper end of which is attached to the claw-shaped saw holder, F. E are guides for the saw holder. The lower end of the saw is attached by means of a stationary pin in the saw, to the saw holder, F, and the upper end to another holder, M, nearly similar in construction. The taking out or change of saws from one size to another, is easily done, without altering any part of the machine.

The straining of the saw is effected by a spring in a novel manner. When springs are employed for this purpose they are apt to give out, after being in use for a short time, in consequence of the rapidity and length of stroke which they are required to make. In this improvement the spring is only required to bend but very little; consequently it can be made stiffer, and will last much longer. The spring here employed consists of a pair of wooden levers, W′ W″. R is a pulley which, in reality, consists of three pulleys fastened together, the outer ones being of smaller diameter than that in the center. The outer end of the lower spring is connected by straps, W W, with the smaller pulley surfaces of R, while a strap, S, extends from the larger or central pulley, R, to the saw holder, M. When the pitman pulls the saw down, the strap, S, turns wheel R in the direction of the arrow, winds up the straps, W W, and pulls down spring W′. During the rise of the saw the spring acts through straps, W W, turns wheel R in a contrary direction, and winds up strap S. Owing to the difference in the diameter of the pulley surfaces the stroke of the saw is greater than the stroke of the spring.—The saw is thus kept continually strained, and the spring is required to move only a very short distance.

When increased speed is wanted without much reference to the finish of the work, the guide holder, N, which supports the guides of holder M, is pushed out into angular position, by means of hand screw, Q, so as to make the saw rake. The upper part of N is pivoted at U, so as to permit such swinging out. G is a guide block, having slots of different depths cut upon its periphery. so as to accommodate saws of different widths. The guide block serves to hold the saw perfectly steady, no matter how rapidly it runs. H is a hold-fast, which presses upon the stuff and holds it to the table. Both G and H are attached to the vertical rod, I, which terminates above in a screw, and is adjusted, at will, to suit circumstances, by means of wheel L. The latter connects with pinion, K, which gears with another pinion on the screw of I.

V is a small air pump, having a plunger, V″, worked by the spring, W′. A tube, S′, leads the air down to the stuff, in front of the saw, and the wind thus conducted, blows away the saw dust, keeping the surface of the stuff always clear, so that the marked pattern may be easily followed by the operator.

We are informed that this machine makes no noise or jarring, and is not liable to get out of order. We have seen specimens of its work which surprised us for their smoothness of finish and intricacy of design. Almost any desired size of saw can be used, and the change from one to another is very quickly and easily made. The machine is constructed upon sound principles, and is evidently destined to have a very extensive employment. It is spoken of in the highest terms by all who have had it in use.

For further information address the patentee, Newark, N. J.

Oregon Coal.

The sample of Oregon coal, mentioned on page 331, as having been sent to us by Mr. Chas. Livingston, of San Francisco, we have found to burn with a clear bright flame, and with great freedom. In its composition it appears to be of a quality between lignite and common cannel coal. Its grain is distinct, and its vegetable origin plain to the naked eye We consider it an excellent fuel for family use and for generating steam.

A flute made of gold is on exhibition in London. The gold was brought from Australia, and the workmanship is said to be exquisite. The weight of the instrument is 14 1-2 ounces, its value about $650.

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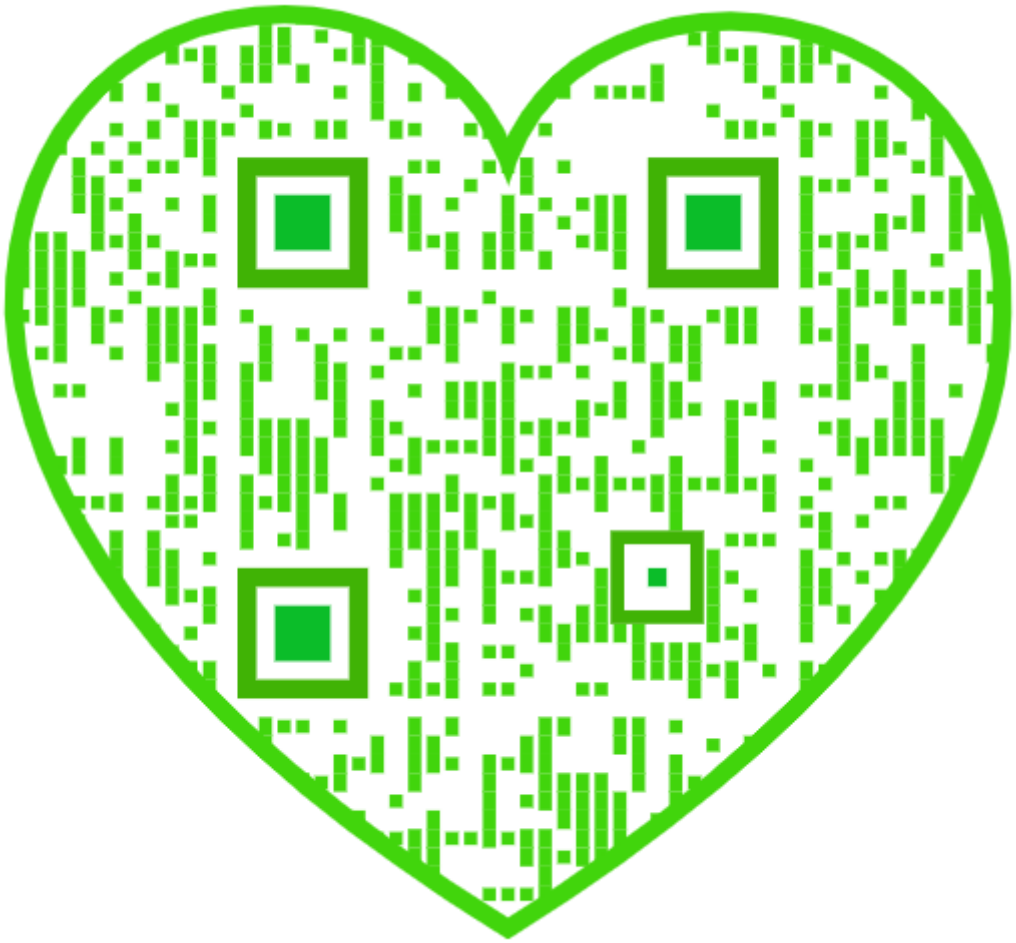

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 8, 1856.

ROTARY STEAM ENGINES—J. M. Colman and Thomas Turton, Milwaukie, Wis.: We claim, first, the engine composed of the rotary piston, D, struck from three centers, as described, and the three oscilating abutments, B, with packing pieces at one end of their concave faces, arranged and operating in connection with the piston in a cylinder, A, in the manner essentially as described.

ROUNDING AND BACKING BOOKS—John E. Coffin, of Westbrook, Me.: I claim the follower, P, clamp formed by the stationary jaw, C, and sliding jaw D, and the sliding bed Q, with hammers, V V, attached, the parts being arranged and operating conjointly as described.

INDEX LETTERING—Edward Crawley, of Cincinnati, Ohio: I claim, first, the arrangement substantially as described, of a circular revolving head, having around its periphery a series of types adjustable radially so as to print an index of greater or less display by a single rapid continuous movement, using for such purpose the described pair of disks of which one has radial grooves, holding a set of types, notched transversely to receive the spiral flange on the other disk, in combination with the securing and tightening nuts upon the arbor and pivot, as described, or devices substantially equivalent.

Second, I claim in this connection the inking apparatus, having two or more inking rollers, and the described distributing mechanism in a vibrating head, attached and supported substantially as described, to a sliding bar, or equivalent devices for the purposes described.

SMUT MACHINES—R. M. Dempsey, of Indianapolis, Ind.: I claim the concave head, E, having vertical rods or spikes, b, attached and fitted within an inverted conical screen, D, the head, E, having wings, d, attached to its undersides, as shown, and its uppersurface corrugated as shown, or in any other manner for the purposes specified.

STAVE JOINTER—J. K. Derby, of Jamestown, N. Y.: I claim the vibrating or tilting bed, G, fitted or pivoted to a bar, E, within the carriage, D, as shown, the bed being operated by the pattern, I, or its equivalent, substantially as shown for the purpose specified,

SECURING PEARL ORNAMENTS—Charles Dickinson and Wm. Bellamy, of Newark, N. J.: We do not claim making the hollow handles by filling the mold with melted metal, and then inverting the mold so that the center portion will run out, for this is an old way of forming the handles and spouts of metal pots or vessels.

We claim inserting or securing the pearl disks or plates, C, in the handle, D, by placing the pearl disks in grooves, a, formed in the mold. The pearl disks having thimbles, b, fitted within them as shown, so that the metal will close around the thimbles, as described.

SHUTTER OPERATOR—Chas. R. Edwards, of Niagara City, N. Y.: I do not claim the use of a crank or the forming of a connection from the hinge to the inside, for the purpose of opening and shutting window blinds, as various plans have been devised.

First, I claim the tapered or rolling tapered cogs, arranged on the under side of a wheel or segment of a wheel so as to mesh with a screw shaft, or spiral thread.

Second, I claim the tapering of the cogs in a direction towards any practical point between the center of the wheel and the casing, as shown, and so as to mesh with a spiral thread, substantially as and for the purposes described, but I do not confine myself to any particular shape or position of said cogs, or direction of their taper, for cogs might be made to operate nearly in the same mannur on the upper side of the wheel, or on a slightly bevel edge of the wheel.

Third, I claim the meshing and operating a screw shaft or spiral thread with cogs on a wheel or segment of a wheel used with the before-described combination, and for opening and shutting, and staying the blind and opening, shutting, and staying the lattice.

Fourth, I claim the constructing of the shaft in two parts, so that one part may be pushed in, so as to unite or mesh with the other, and slide together so as to shorten or lengthen the shaft, substantially as and for the purposes described.

Fifth, I claim the piece (fig. 5) or its substitute for the purposes described, and the plan for fastening the same to its place, as described, and the plan of the enclosure for holding the screw.

Sixth, I claim the general plan of opening, shutting and staying the lattice by use of the knee lever, and with the combination described, and operated by a slight turn of the knob crank, s.

ATTACHING SHAFTS TO VEHICLES—F. J. Flowers, of Brooklyn, N. Y.: I claim the rod, B, on the goose-neck or bar, A, fitted in the eye, C', on the bar, C, the cap, D, attached to the bar, C, and the nuts, E E, on the rod, B, the nut, E, having flanches, d, attached to them, and fitting over circular or annular ledges, c, on the ends of the cap and eye, the parts being constructed and arranged as described.

QUARRYING AND CUTTING STONE—Chas. Frost & A. W. Webster, of Waterbury, Conn.: I claim the combination of the cutter stocks or blocks, H, and cam, M, the stocks or blocks being pivoted to the pulley, G, which is placed on a shaft, E, in the frame, D, and the cam placed loosely on the shaft, E, the above parts being otherwise arranged and operating, as shown, for the purpose specified.

FELTING HAT BODIES—Wm. Fuzzard, of Cambridgeport, Mass.: I claim the apron, E, connected to the vibrating or reciprocating roller or cylinder, C, and to the adjustable platform, D, and arranged in relation to the reservoir or box, A, substantially as described.

FIRE ARMS—J. E. Halsey, of New York City: I do not claim uniting the charge in the center, nor in its whole length simultaneously, nor at its forward end when a needle is used to explode a fulminate placed in the ball or between the ball and the powder.

I claim the tube, a, constructed of such a length and placed in tuch a position that it shall serve as a means for communicating fire from the cap to the forward end of the charge of powder only, substantially as described for the purpose specified.

BRICK MACHINES—J. A. Hamer, of Reading Pa.: I do not claim the mold wheel, or the manner in which the plungers are operated, viz., by means of the stationary guide plate.

But I claim the adjustable segment, F, of the guide plate in combination with the plungers, D, arranged as described and set forth.

Second, I also claim dusting the molds of the mold wheel with fine dry sand, preparatory to their being filled with clay, by means of the arrangement and combination of the blower or fan, T, the sand box, S, the shaker board, Q, the arm, U, weigh ball, V, and shaker rod, W, operated in the manner described.

Third, I also claim the sliding gate, G, so constructed and operated by means of a small roller, H, running in the guide plate, I, that the mold is filled at the end by means of the screw in the shell, o, while the wheel is in operation said gate being closed, while the mold is filling, and open during the discharge of the brick.

RAKING ATTACHMENT FOR HARVESTERS—C. Wheeler, Jr., of Poplar Ridge, N. Y.: I do not claim a reciprocating rake operated by the cords attached to a pulley, M, having a reciprocating rotary motion, irrespective of the mode of operating said pulley and the arrangement of the rake.

But I claim the disk, J, with the teeth, a b, attached and gearing into a pinion, L, on the shaft, K, of the pulley, M, in combination with the cam, U, rod, T, and guides or ways, P P, between which the slide, R, to which the rake, R', is attached, works, the parts being arranged and operating for the purpose specified.

PADLOCK—Solomon Andrews, of Perth Amboy, N.: J. I claim making a spring to answer the double purpose of a spring and ratchet tumbler, which I denominate a spring tumbler.

I also claim the opening spring, being a spring brought into action by the key, for the purpose of drawing back the hooks or unlocking the locks.

I also claim the combination of the spring tumblers with the hooks, in the manner set forth, holding back the hooks when unlocked, so as to constitute a perfectly racked tumbler lock—a self-locking one.

EXTINGUISHING FIRES—Robert B. Armitage, of Philadelphia, Pa.: I do not claim the cords and lever or the valve, they having been long in use for other purposes.

But I claim the arrangement of the main pipe with the branch pipe, the arms and jets, which, in connection with the cords and lever combined, operate as a self-acting fire extinguisher substantially as described.

UPSETTING TIRE—Henry Barringer, of Berry, Ill.: I am aware that iron has been upset by clamping it in different ways and then pressing it together; but I know of no apparatus whereby the iron can be clamped and unclamped by a single motion of one lever, as described. Therefore I do not claim clamping iron for the purpose of forcing the clamps together, and thereby upset said iron.

But I claim the combination of the slotted bar, t, the clamping lever, n, and sliding plate, g, with the clamping lever, r, for the purpose of clamping and unclamping the tire with one motion of the lever, n, the whole being arranged and constructed as described.

DRAWING WATER FROM WELLS—H. B. Barber, Scott, N. Y.: I claim the use of lever, o, in combination with the two pawls, R and R', and toothed pulley, C, or their mechanical equivalents, constructed and arranged as described, for the purpose of automatically arresting the pulleys when the buckets are at a given hight, and keeping them suspended during their discharge, substantially as described.

I further claim combining the two pulleys, E and G, mounted on one shaft, and driven by the same pinion, with the hasp, d, and thumb screw, m, for the purpose of connecting or disconnecting said pulleys, and thus working one or two buckets, substantially as set forth.

ROTARY PUMPS—James A. Bazin, of Norfolk, Mass.: I claim the means employed for moving the two pistons alternately, the same consisting of the toggle arms attached to the cranks of the pistons, and operating in the circular grooves, W X, in such a manner as to hold one crank and its piston stationary while the other crank and its piston are moving, as set forth.

ROOFING CEMENT—Horace Billings, of Beardstown, Ill.: A cement composed of gum shellac, rosin, and linseed oil, in substantially the proportions set forth, was secured to me by a patent bearing date the 9th of April, 1850, re-issued March 25th, 1851, and that my present invention consists merely in adding powdered steatite or soapstone to the aforesaid sement, by which a composition is produced that forms a tough elastic and very durable water proof outer coating for roofs, &c., but it is not adapted to the protection of meats, &c., like the cement described in my patent aforesaid.

I claim my roof-coating cement or composition produced by combining shellac (or seed lac) rosin, linseed oil, or its equivalent, and powdered steatite, or its equivalent, in proportions which will give the said composition the character and adapt it to the purposes substantially as set forth.

BRICK MACHINES—H. Braman and R. Peterson, of Greencastle, Ind.: We claim, first, the mold box, T, provided with the plungers, l, when said plungers are operated by the springs, s, and rods, o o, working in the grooves, q r, for the purpose of allowing the mold box to receive the clay and also to eject the compressed clay therefrom, when the described parts are constructed, arranged and operated as set forth.

Second, we claim operating the mold box, T, when constructed and arranged as set forth, or giving it a reciprocating motion with the necessary dwells to allow the box to be filled with clay, and also to allow the clay to be pressed therein by means of the rack bar, o', and wheels, R P Q, when arranged and operating as shown and described.

Third, we claim the combination of the plunger, D, rods, o o, working in grooves, y r, with the mold box, T, provided with the plungers, l, when the parts are arranged and operated relatively with each other, as shown, for the purpose specified.

VISE—Hiram C. Brown, of Yellow Springs, Ohio: I claim the rod, M, arranged and operating so that by pushing it back endwise both ends will be simultaneously raised, and thereby lift the pawl, a, from any part of the ratch.

I also claim adjusting and retaining the jaws parallel with each other, or to any desired angle, either by varying the length of the brace rod between its points of contact at the top and on the movable jaw or by varying the position of the lower point of contact, substantially in the manner described.

I also claim the use of the adjustable sliding rod, H, arranged and operating in connection with the brace rod, I, substantially in the manner described.

DIES FOR STAMPING OR PRESSING SHEET METAL—Wm. M. Booth and James H. Mills, of Buffalo, N. Y.: We claim pressing, stamping, or forming metal, viz., the upper and lower dies, A and E, or their equivalent, the said dies being movable parts, B and G, supported by springs or their equivalent, the whole being constructed and operated in the manner set forth.

HITCHING HORSES, CLOTHES LINES, &C.—Edward S. Boynton, of East Hartford, Conn.: I claim the application of a cam shaped lever for horse hitches, in the manner and for the purpose substantially as described.

ROTARY PUMPS—Charles N. Clow, of Port Byron, N. Y.: I am aware that the cams, A A, have been heretofore used, and I therefore do not claim them as new.

But I claim the roller, C, or its equivalent, inserted in the manner and for the purpose described.

TURNING MACHINE—Elbridge Webber, of Gardiner, Me.: I do not claim turning from a reverse pattern by suspending the pattern and turning centers in a vibrating frame.

Nor do I claim turning from a fac simile pattern by means of a movable cutter carriage.

But I claim the arrangement of the frame containing the pattern and turning centers relative to the gauge rod and cutter carriage, as described, whereby the said frame may be fixed and the carriage movable, or the reverse, so that either a fac simile or a reverse pattern may be used without any change in the machine.

HAND PRINTING PRESS—Daniel K. Winder, of Cincinnati, Ohio: I claim the arrangement of the distributor, 6, and inking roller, 7, to the platen, 3, as represented, and the said distributor actuated by the lever, 4, and link, 9, only when said lever, 4, is made to actuate the vibrating shaft, 14, when said shaft is provided with the cam, 5, for pressing down or operating the platen, as set forth.

CLEANING THE TOP FLATS OF CARDING ENGINES—Horace Woodman, of Biddlefield, Me.: I claim, first, the arrangement of gears, Y Y', on the cleansing frame, and in combination therewith, in manner substantially as deseribed, the studs or pins, J and J', on the inner sides of said gears, and the levers, I and I', and the stationary bars, K and K', operating together with the slotted or corrugated arches or flanges for the purposes set forth.

Second, I claim the said slotted or corrugated arches, whether cast with the main frame of the card or attached thereto as specified, and this I claim as a means of holding the cleansing frame in place while the top cards are raised, stripped, and depressed, and also as a means of regulating the reciprocating movements of said traverse or cleaning frame from one side of the card to the other and also from one card to any other, in the manner specified.

Third, I also claim the combination of the lever, o, and stripping rod, g, with its dogs, M and M', and sliding clutch, arranged as described, to reverse the motion of the cleansing frame.

Fourth, I also claim the arrangement of waste pan, F, as described, with a narrow bar and strip of filleting attached to the front edge of the pan, so placed as to remove the waste from the cleansing bar, V, to produce a clean brush bar for the cleansing of each top card.

CURRY COMBS—Asahel A. and Andrew Hotchkiss, of Sharon, Conn.: We do not claim striking up or forming a curry comb, from a solid sheet or piece, as this was patented to Andrew Hotchkiss, on the 13th of March, 1849. We claim the turning of solid corners upon the shell to save riveting, as set forth, and the serrating of the ends of the shell to form teeth thereon, the corners of the plate being first scalloped out, so as not to project beyond the teeth after they are bent up into shape, as set forth.

KNITTING MACHINES—James B. and Walter Aiken. (assignors to Herrick and Jonas B. Aiken,) of Franklin, N. H.: We claim, first, the hollow circular needle plate having grooves cut in its inner surface, substantially as described.

Second, we claim the horizontal groove, C, near the bottom of the cone, so arranged in relation to the inclined operating groove that the needles may be retreated thereto, as descr bed, and retained therein when they are not wanted to operate on the fabric knit, as set forth.

Third, we claim the switch, g, arranged substantially as described, to change the needles from the inclined operating groove to the retreating groove.

JACQUARD LOOMS.—John Goulding, of Worcester, Mass. English patent dated Nov. 22, 1855: I claim, first, the combination and arrangement of the mechanism described for operating the suspension and trap boards in Jacquard looms, that is to say, lever, 81, sector, 15, on shaft E, pulley, 16, on shaft F, connected by a chain or belt having slots, P and 12, suspension and trap board, 10 and 11, connected to the lifting rods by arms, 51.

I claim the lever, 89, sheet, 1, or its equivalent, operated by the tappets, 88, or their equivalents, so arranged as to lock the beams or straight and ground warps, as described.

I claim the mode of giving tension to the warp threads or yarn taken from bobbins, as shown, sheet, 1, by drawing it against itself or the bobbin or yarn which remains upon it, by means of a weight, or its equivalent, but so arranged as to be lifted by the yarn when it is drawn and release the bobbin and allow it to turn until the yarn delivered permits the weight to descend again and stop the bobbin by the friction of the weighted yarn against it, substantially in the manner described.

I claim the traver-ing board, 1 and 7, sheet 2, or its equivalent, arranged upon the knot cords pile or figuring harness below the warps, substantially as described, to bring down any single cord which may catch accidentally, so as not to be brought down by its own weight.

I claim holding the parting by hanging them to a rod in rear of the heddles, and passing them between the upper and lower loops of the heddles, as described.

I claim the trap boards pierced in the manner described, combined with the needles, constructed as described, when arranged as set forth.

I claim the thimble or socket, 120, sheet 3, or its equivalent, for receiving, stopping, and holding the shuttle in the box, as described.

I claim the apparatus for holding and drawing up the filling or binding weft for the purpose of tightening the selvege, as described.

I claim the arm, 100, and score, 121, constructed, arranged, and operated, substantially as described, or their equivalents, to carry the weft thread from the fell at the edge of the cloth nearly to where the pile warp crosses or makes an angle with the shed, as described.

I am aware that a knife revolving on an endless belt has been used, I therefore do not claim this feature.

But I claim the application of the knife, 175, in combination with its guides, arranged in the manner and for the purpose specified.

AUTOMATIC CANNON—Charles E. Barnes, of Lowell, Mass., (assignor to himself and Moses W. Oliver, of Manchester, N. H.): I claim the arrangement by which I impart a reciprocating and intermittent motion to the breech pin, H, by gears, H2 and J2, and cams, G2 and I2, so that the gun or cannon may first receive the cartridge and then close the bore of the cannon back of the cartridge, bringing the nipple on which the percussion cap is placed, in the center and immediately back of the end of the cartridge, ready for firing, essentially in the manner and for the purposes fully set forth.

I also claim giving the ram rod or plunger, Y, a reciprocating and intermittent motion for placing the cartridge, Y2, within the gun, and firing it, when so placed, by means of a hammer, Y5, in the plunger, Y, operated by the spring, D3, and latch, c, arranged and operated in the manner and for the purposes set forth.

I also claim the cap wheel, D2, and its slide rods, U and P3, so arranged and operated as to place or deposit the cap upon the nipple. I5, when the breech pin, H, is drawn back so that it can then be advanced or slid into the gun with the cap placed on the nipple, L5, therein, ready for firing, essentially in the manner and for the purposes fully set forth.

I also claim the cartridge box, J, so arranged and operated by the breech pin or otherwise as to deposit the cartridge into the receiver, S3, ready for the plunger or ram rod to force it into the bore of the gun, as set forth.

I also claim the catch, i3, or its equivalent on the latch, c, or otherwise formed, arranged, and operated to stop the movement of the firing apparatus to prevent accidents and clogging the cannon with surplus ammunition, as set forth.

BASE DAMPER FOR MELODEONS, &C.—Riley Burditt, (assignor to Jacob Estey and Hartsel P. Green,) of Brattleboro', Vt.; I claim the base damper, E, applied under or within the swell, in combination with the lever, F, and spring, e, so that it may, at the pleasure of the player, be caused to open with the swell, or remain closed while the swell is open, as set forth.

CONSTRUCTING DAMS—Waldo P. Craig, (assignor to himself and William R. Rightor,) of Newport, Ky.: I claim the construction and application, substantially as described, of the follower piles, each pile being formed from a plank having tapering sides and parallel edges, with a slanting termination at the thin end running to one edge, and chamfered on each side of the slant, and with the described batten, or its equivalent, pointed from both edges and chamfered from its outer side, one edge of the batten projecting beyond the longer edge of the pile so as to form a rebate fitting and overlapping the edge of the preceding pile, as described.

LOOMS—Wm. J. Horstmann, of Philadelphia, Pa.: I claim the permanent attachment of the pile wires, by one end, to independent sliding rods, which are carried each on one side of the warp and controlled by springs in such a manner as to allow them an independent movement longitudinally to the warp, by transversely sliding bars, B B, the said rods, bars, and springs, being operated and operating in combination with each other, substantially as set forth.

I also claim the spring, latches, I I, acting in combination with the rods, E E, of the pile wires, substantially as set forth.

REVERSIBLE HORSE POWER—P. H. Kells, of Hudson, N. Y.: I claim constructing the machine so that the shaft of the over-reaching belt pulley may be reversible, when the gear wheel shall be shifted to and secured upon the opposite end of its shaft, and that in every such position of the pulley shaft, the end of the gear shaft and the fastenings thereon shall be within the plane of the inner side of the arms, spokes, or face of said pulley; the gear wheel fastenings being the same on both ends of its shaft, and so related to the pulley shaft that the converge shall duly mesh with the pinion of said shaft, at each change of position of these several parts, substantially as set forth, for the purpose of changing from a right to a left hand machine, or the reverse.

WHEEL FOR STEAM CARRIAGES—A. B. Latta, of Cincinnati, Ohio: I am aware that the different parts composing the wheel, have been separately used before, which I disclaim when taken separately.

But I claim the combination of the tire, e, angle tire, d, sectional tire, f, cross spokes, B and C, and jamb nuts, 6, for purposes mentioned.

VESSELS—James Minifie, of Baltimore, Md.: I claim the arrangements of the driving wheels, M, the steel foundation pieces, R, and the rods and bars connected therewith, and with the propellers as they are described, in relation to the vessel, operating as set forth.

STONE SAWING MILL—E. A. Mills, of Du Buque, Iowa. I claim operating the saws, when arranged upon the top of the frame, A, so as to work at right angles to each other, as set forth, by means of the feed plates. H, and knuckles, i, in combination with the mechanism for elevating the block of stone, when the same is constructed, arranged, and operating as described.

COAL—Ephraim Morris, of Bergen, N. J.: I claim the pulleys, b and c, geared together so as to prevent the rope slipping, when combined with the ratchet wheel, h, pawl, i, and stop, 2, or its equivalent, whereby the bucket is sustained in its elevated position while being drawn along in either direction, and can only be lowered when the pawl is disengaged from the ratchet wheel, h, substantially as specified.

I also claim the bails, m m, fitted with hooks to take the loops, l, on the bucket, H, when the same is elevated, and dump the contents thereof by drawing up said bails, substantially as specified.

I also claim the adjustable rope, q, with its knot or roprjection, 11, for taking the traveler, 10, and through the chains, 8 8, n, and pulleys or drums, O and P, drawing up the bails, m m, by the motion of the car, and dumping the contents from the bucket, H, substantially as specified

DOVETAILING—L. A. Orcutt, of Albany, N, Y.: I claim the combination of the double frames or carriages for producing the canting or rocking and the vertical, and horizontal motions described, for cutting dovetails and tenons or counters, substantially in the manner set forth.

I also claim the variable dog, R, and pattern, N, for spacing, regulating, and holding the stuff under the action of the cutter, as set forth.

COOKING STOVES—Henry S. George, (assignor to himself and George Gratton,) of Syracuse, N. Y.: I disclaim, when separately considered, the passing of hot air between the oven plates and the passage for the products of combustion; also the placing of air flues through and around the fire chamber, and the supplying of the fire draft with heated air.

But I claim the arrangement substantially as set forth of the air flues through and around the fire chamber and the hot air channel, 6, between the oven plates and the passage for the products of combustion with the dampers, 8 and 9, for supplying the fire draft with hot air, as set forth.

TANNING HIDES—S. W. Pingree, of Methuen, Mass.: I claim, when the hide is to be tanned with the hair either on or off as the case may be, removing or skiving off the inner layer thereof, or the same and a part or parts of the middle layer of it preparatory to immersing such hide in the tanning liquor.

GUIDING CIRCULAR AND OTHER SAWS—Orrin Rice, of Cincinnati, Ohio: I claim the application of the spring in any shape or form, to any anti-friction substance to be applied directly against the saw, and by traversing over the uneven surface thereof, preventing the saw from trembling and for strengthening, steadying, and guiding the same while in motion, thereby enabling a much thinner saw of the same diameter to be used than otherwise could be without the application of my improvement, thereby effecting a great saving in power, timber, and repairs.

Also the application to govern the side moving or lateral motion of large saws for sawing logs, occasioned by the springing of the same,

LOCOMOTIVE REFLECTOR LAMPS—F. J. Seymour, of Waterbury, Conn.; I claim constructing the reservoir of locomotive lamps so that the reflector becomes one side of said reservoir, for the purpose of heating the contents thereof, and rendering the same liquid and limpid, substantially as specified.

I also claim constructing the reservoir of locomotive lanterns by means of a case surrounding the whole reflector and provided with the air-tight screws, i k, so as to cause said reservoir to become a self-supplying fountain to the burner tube, f, as specified.

I also claim regulating the supply of oil or other burning material to the flame of a lamp, or shutting off said supply by means of compression on the wick by the cock, g, or its equivalent, as specified.

I also claim placing the chimney to the rear of the vertical line over the flame, when the draft is supplied at or near the front of the reflector, in the manner and for the purposes substantially as specified.

HORSE SHOE—Sewall Short, of New London, Conn.: I claim the combination of the cap and shoe, made in two separate pieces, the cap and shoe being constructed separately, substantially in the manner and for the purposes of easy application and ready removal.

I also especially claim the rib and groove attaching the cap and shoe. as described.

BREECH-LOADING FIRE ARMS—Wm. Mt. Storm, of New York City: I claim, first, the arrangement of a portion of the barrel at the rear, sufficient to contain the charge, to swing by a hinge upon the exterior, (as quite distinct from oscillating upon trunnions) out from the line of the bore for the most convenient insertion of the charge in combination with the stationary, wedging incline at the rear, with which it is made to correspond, and which receives the recoil, all as shown.

Second, I claim, in combination with the so hinged chamber, the long tapering valve face, projecting across the joint, so far as by itself to bolt the chamber into the barrel to such an extent that no lateral force or blow can displace it from the exact line of the bore, or, as would be the case with an obtuse angle of valve face, wedge the face of the valve laterally against its seat, while at the same time, the taper of said valve face, shall be such in relation to the joint of the hinge that it shall swing out of and into its seat without slide upon the latter, for the reasons given.

Third, I claim making such valve face upon the end of a loose tube of some hard unplasting metal projecting or extending back into the loading chamber, of which it constitutes an essential and permanent part, and of such strength and thickness, that it shall effectually resist any change of size or form by the force of the explosion or expansion, thereby outwardly against the interior of the chamber by which its freedom to drive bodily forward, as designed, in the manner of a poppet valve into its seat, by the force of the explosion to close the joint would be prevented, said tube being formed open to the full size of its bore at both ends, and thereat slightly exceeding in bore the bore of the gun for reasons rendered clear, and as is essential.

Fourth, I claim extending the rear of the so constructed tube, so far back, into the chamber and no further, that the annular edge of its open rear shall terminate opposite to or slightly in front of the point of first ignition of the cartridge, so that while its end at this point terminates and fits closely against the cylindrical sides of the chamber to prevent the explosion from passing between them, the edge of its end or the annular surface facing rearward being left purposely exposed to the forward face of the explosion, the tube will be forced ahead to close the joint between the chamber and barrel at the earliest instant of discharge, to the end that if the ball should be a loose fit in the tube, and at the same time not a Minie, and thus permitted escape of gas past it before it reached and tightened in the creases, the gas should not be left free to pass through the valve joint, causing cutting, as explained.

Fifth, I claim, in combination with my tube, so operating and constructed, a fringe or edging of soft metal soldered to its rear annular edge and beveling off rearward thinner than the tube itself, so that this thinner edge shall be easily driven by the explosion slightly forward and outward into the annular corner formed by the edge of the tube and the side of the chamber closing the joint between them tightly at this point, but leaving them elsewhere a loose fit, while each thin edging of soft metal cannot have stiffness sufficient to prevent both it and the valve from being freely driven forward in the chamber by the explosion, for the purpose known.

Sixth, I claim the bolt projecting through the recoil bearing into the breech and so connected with the lock that it must move continuously and simultaneously with the hammer, and therefore the fall of the hammer upon the cap being under all circumstances made dependent upon the bolt, having properly entered and secured the chamber, while moreover, by this means, the bolt which might otherwise be prevented from flying forward into the breech by rust or dirt, is thus forced home by the whole power of the lock.

Seventh, I claim tapering the forward end of said bolt beneath, that if the chamber is not quite home to its place, when the trigger is pulled, the bolt will bring it so, before the hammer reaches the cap.

Eighth, I claim connecting said bolt with the tumbler by the slotted head, embracing the heddless stud, or screw in the tumbler, so that there being no actual attachment of the bolt and lock, the latter may be removed in the ordinary way, without regard to the former.

Ninth, I claim cutting away the recoil bearing below the center of the bore to insure that the explosion shall tend to throw the chamber the more tightly down into the stock, in lieu of any chance tendency upward out of its seat.

Tenth, I claim the fixed unyielding stud and bearing screw for receiving the force of this downward action that it may not be exerted upon the underside of the valve face.

Eleventh, I claim forming the recess in the stock beneath the chamber to receive any powder spilled in loading with a broken or leaky cartridge, so that it shall not block under the chamber and prevent it coming down to a horizontal line and in contact with its bearings.

Twelfth, I claim the arrangement of the hinge of the chamber upon the top of the latter in lieu of elsewhere, whereby the chamber is thrown over in the most elevated and unobstructed position for the insertion of the cartridge, while the barrel will then bear the weight of the chamber, when open, and not the joint of the hinge and the stock need not be cut away and weakened, as would be the case of the chamber swung laterally and at the same time the hinge can constitute the crotch sight.

Thirteenth, I claim making said hinge a spring, and so arranged as to yield, as described, in case of any obstruction lying or adhering in the valve face.

Fourteenth, I claim swiveling the chamber so that when open it may be turned with its mouth vertical for convenient loading with loose ammunition, while the weapon lies horizontal, &c., as explained.

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BRUSHES FOR DRESSING WARPS—Samuel Taylor, of Cambridge, Mass.: I claim my warp dressing brush as made with the external ends of its bristles cut slantwise or beveled with respect to their stocks, in manner as specified, and for the purpose of enabling the warps to center the brush with more facility than would be the case were the points cut off square in the usual way.

WATER WHEEL—John Tyler, of West Lebanon, N.H. I claim giving the head of my improved water wheel an upward curvature from center to circumference for the purposes as set forth.

Second, I also claim the peculiar shape and position of the series of buckets within the wheel, viz., the convex surface of each bucket having the shape of the segment of a circle whose radius is one-third longer than the radius of the wheel, whilst the said buckets are so arranged that the convex surface of each bucket is tangential to an imaginary circle, whose center is the center of the wheel and whose radius is one-third the length of the radius of the wheel, substantially as set forth.

Third, I also claim connecting the lower edges of the buckets to each other by means of a scolloped ring, f, of such a shape that the water will be conducted from the scroll-shaped water way directly against the central portion of the convex surfaces of each bucket, and then pass freely downwards between the buckets, substantially as set forth.

SHINGLE MACHINE—A. V. B. Orr, of Lancaster, Pa.: I am aware that reciprocating plates have been constructed with tapering faces or recesses, to give the necessary taper to a shingle in carrying it under a stationary knife: and I am also aware that frows or riving knives have been used which were movable, I therefore wish it to be distinctly understood that I do not claim any of these devices separate from the combination in which I use them.

But I claim, first, combining in a single reciprocating plate, E, a straight face, a, tapering face, s, with an offset, R, between them, and a movable frow, I, being combined for the purposes specified, and constructed substantially as described.

Second, I claim the compound lever, K, constructed as described, or its equivalent, for the purpose of taking the finished shingle off the plate, as set forth.

SOUNDING GUARDS FOR VESSELS—John Guest, U. S. N., of Washington, D. C.: I claim the mechanical construction of the machine described and especially the attachments of the radius bars, B B, working in the grooves, C C, by which I am enabled to indicate the approach of shoal water, whether the vessel be going ahead or astern.

RE-ISSUES.

SECURING PINIONS &c. OF WATCHES IN LATHES—James M. Bottum, of New York City. Patented July 15, 1851: I claim the employment of adhesive cement for securing staffs and pinions of watches and like articles of small dimensions for lathe operation, in combination with a chuck, A, having a female center therein, either with or without the tube, B, or its equivalent, as described.

HARVESTERS—Eliakim B. Forbush, of Buffalo, N. Y Patented July 20th, 1852: I claim, first, extending or widening out the guard finger, as described and represented by the overhanging bars, m m, for the purposes set forth.

Second, I claim the dropping that part of the frame called the clamp down to the ground, as set forth, when constructed and arranged as described.

Third, I claim the mold board, L, constructed and used as described.

Fourth, I claim the arrangement and combination of a right angled stanchion, made of wood or metal, with a pivotal motion on the frame work of the machine, and supporting upon its upright part a lever made of wood or metal, with a pivotal motion on the said stanchion or post, to which lever is attached a rake. By the combination and operation of these two pivotal motions of the stanchion and lever, as set forth, a direct line motion may be given to the rake when needed, and also a circular motion, so that a person may remove the grain from the platform in bundles, and sit or stand on the machine near the driving wheel, as described.

DESIGNS.

ORNAMENTAL FIREPLACES—John C. Macy, of Cincinnati, Ohio.

PARLOR OVENS—Russel Wheeler and Stephen A. Bailey, of Utica, N. Y.

ADDITIONAL IMPROVEMENT.

LOOMS—James O. Leach, of Ballston, N. Y. Patent dated Oct. 30th, 1855: I claim, in operating a loom, the employment of two sets of cams, four in each set, the same being movable to the right and left without changing their intervals, and in either position producing a tubular cloth, one set being arranged in reference to the other, so that the shift of the cams shall make the harness shift the warp, instantly carrying that part forming the upper web downward, and that forming the lower web upward, making at their crossing a firm single joint.

[For the Scientific American.]

Kiln Drying by Dry Steam.

I could purchase the lumber green, and sell it the next day seasoned, at a great advance on the combined cost of the lumber and the drying, although I did not at that time pretend that it was perfectly seasoned, though it was seasoned as well as if it had been stuck up in the air six months or more.

It extracted the vegetable albumen, and left the lumber free to work, and by its peculiar properties in drying rendered the lumber susceptible of a better finish and a higher polish. One of the important advantages of this mode of drying is, that the lumber is dried at the *center* first, thus making perfect work of it, when the kiln is properly managed.

And now for the expense of doing it. I will not give the various modes which I have used in my experiments with this new principle during the last nine years in which I have been testing it, but will state what I am doing with it now.

I constructed a cheaply built kiln last spring, for the purpose of showing that a cheap kiln would dry lumber; and if a poor kiln will dry lumber, a good one should do it better. My kiln (built all of second-hand material, with a view to cheapness) held 10,000 to 12,000 feet of lumber at a time; it cost in its construction $40, exclusive of my superintending. When completed, I filled the kiln with lumber, consisting of basswood, pine, whitewood, maple, and beach, from one inch thick to 4×4 scantling. I attended the fire thirty hours, or two and a half days, by daylight, and used about half a cord of maple wood for fuel, and took out the lumber, dried in the most beautiful manner, in readiness for immediate use. In some instances it will take a little more fuel; but I have not, in this kiln, used more than one cord of good wood to dry 12,000 feet of even 4×4 scantling. I could arrange this kiln to dry the 10,000 feet in twelve hours, but it would cost a little more.

I now feel prepared to compete with any or all other modes for the kiln drying of grain, flour, meal, lumber, fruit, vegetables, &c., as well as for all of the various uses for which it is important to have a dry kiln.

You are already aware that the French have tested super-heated surcharged dry steam, or *stame*, for kiln drying lumber, and have reported to the Academy of Science that lumber kiln dried in this manner was increased in its strength from 2-5 to 5-9, and rendered susceptible of a higher polish. But the French made their steam by means of pressure. They put the lumber into a steam boiler, and then surcharged the steam by means of pressure. A dry kiln in the French plan, by pressure, that would season 10,000 to 12,000 feet at a time, would cost not less than $4,000, or as many dollars as mine cost cents. Besides, I should have this important advantage over them, viz., that my lumber may come from the steam entirely dry and ready for use, while theirs comes out saturated with water.

Lumber may be seasoned and not dried on my plan, or it may be seasoned, and dried in the same kiln, no material difference in the expense of the two, and only a small difference in the amount of time.

One gentleman in Massachusetts filled his kiln (built on my principle) holding about 6000 feet of lumber, and had kept a fire under it for six hours only when he had an order for another kind of lumber, which must be dried and shipped at once. He ordered the lumber in the kiln to be thrown out, and the lumber to fill the order to be substituted, intending to put the lumber in again and complete the drying as soon as the lumber to fill the order had been dried. But when, in a few days after, the workmen went to put the lumber in again, they found it perfectly dry. Thus the liquid portion of the vegetable albumen, or, in other words, the sap in the lumber had been all converted into steam in six hours, and the moisture left by the steam had passed out by a few day's exposure to the air, and left the lumber dry.

I regard this as an economical mode of drying, viz., to remove the lumber from the kiln as soon as the sap in the lumber shall have been made into steam, and then let the moisture of the steam pass out by an exposure to the air. This not only saves time and fuel, but almost entirely supersedes any danger of burning a kiln of lumber.

It would be somewhat difficult to burn a kiln of lumber while the sap is being made into steam (on my plan) if the kiln is properly built and managed. I shouid have but little fear to set a kiln on fire intentionally. But when the steam has all passed out and the lumber is thoroughly heated, I am well convinced that a gas is produced from the dried lumber, which will take fire when it shall have become sufficiently dense in the kiln. When a kiln is thus set on fire it is very difficult to extinguish it, since the fire is at the same instant communicated to all parts of the kiln.

When it is necessary or desirable to have the lumber come from the kiln entirely dry and ready for use, I take the precaution to diminish the heat in the arch in proportion as the flow of steam from the lumber is diminished, to waste away the heat. When no steam is passing out the heat accumulates rapidly if the fire is not diminished.

I have thus had but a small loss of lumber by fire during the last nine years. One kiln I set on fire for an experiment, and after keeping it on fire for an hour I extinguished the fire alone, with a loss of only a few feet of lumber. Another kiln was fired by the torch of an incendiary in the night, and still was put out without much damage, as it was set on fire on the outside.

H. G. BULKLEY.

Kalamazoo, Mich.

Agricultural Premiums.

The Illinois State Agricultural Society, is a spirited institution: it offers no less than $7000 in prizes to be awarded at its Annual Fair, to be held at Alton on the 30th of September next. The hotel keepers of Alton have published the prices they will charge during the time of the Fair, which is low; this is commendable.

(For the Scientific American.)

The Sun.—No. 3.

[Concluded from page 331.]

By observing the apparent paths of the solar spots across his disk, the inclination of the sun's equator to the plane of the ecliptic may be determined. This may be accomplished on the 1st of March or the middle of September, when the apparent paths of the spots have their maximum curvature, and the earth has its greatest distance from the sun's equatorial plane. A spot on the solar equator will then have its apparent ingress and egress exactly at the east and west points of the disk respectively. Its angular distance from the sun's apparent center, when half-way over, or on the bisecting perpendicular of his disk, divided by his semi-diameters in the same unit of measure, will give the *sine* of the angle made by the solar equatorial plane with the ecliptic. M. Delembre, the eminent mathematician and astronomer, makes the inclination of the solar equator 7° 19′, and the heliocentric longitude of its ascending node 80° 45′; but later observations by Dr. Petersen, of Altona, give 6° 51′, for the inclination, and 73° 29′ for the position of the node. Others have assigned 7° 20′ for the inclination, and 80° 21′ for the nodal position. A suspected motion of the spots on the solar surface may render all such determinations somewhat uncertain.

Any spot on the sun, providing that it lasts for a sufficient length of time, returns by the rotation of this orb to the same apparent point on his disk from which it sat out in a few hours above twenty-seven days. The earth, however, during this time, has advanced about as many degrees of the ecliptic in the same direction with the spot; hence, to ascertain the true time of the sideral revolution of the spot, or, what is the same, the period of the sun's rotation on his axis, we may pursue a course similar to what we should for finding the sidereal period of the planet, having the length of the synodical revolution given. The sun rotates on his axis from west to east in about 25 days 7 hours and 48 minutes. The spots transit his disk from east to west in about thirteen and a half days. The period of the rotation of the sun is somewhat uncertain, on account of the changes going on in his luminous envelope.

The region of the spots is generally confined within 35° on each side of the solar equator. They are never seen in his polar regions, and rarely beyond his fortieth parallels of latitude. Spots, however, are less common on his equator than in zones at some distance from it on each side. The zone included between 10° and 15° north of the solar equator is particularly rich in large and durable spots. A similar zone to the south of his equator is frequently marked with spots. The durations of the different spots are as various as their magnitudes. They are generally of not very long continuance; some smaller ones are formed, and again disappear without making an entire transit of the disk. They often make one or two revolutions, being identified at their reappearances by their positions on the disk, magnitudes, or configurations, and the interval between their disappearances and apparitions. In rare cases they have been observed to last during many axial revolutions of the sun. A great spot in 1779 remained on the sun for six months; and a group of spots, in 1840, was observed to return during eight consecutive revolutions. It has been remarked that, for the most part, those parts which appear suddenly are as rapidly closed up, while those which come on gradually are of longer continuance, and are as slowly dissolved. Sometimes they appear to close up rapidly, and are succeeded by others breaking out in adjacent portions of the disk. They have rarely been seen to break out and close again in a few hours.

Besides the dark spots there are bright ones often seen in great numbers near the margin of the solar disk, appearing like small and intensely brilliant ridges or wisps, which, as has been before noticed, are termed *faculæ*. They are more numerous in the vicinity of groups of maculæ generally, and their appearance on any part of the sun's disk is thought to forebode the breaking out of the dark spots.—They are more numerous in the zones characterized by the frequency of the other spots. Sometimes they extend over a considerable portion of the sun's face, and are frequently changing their magnitude and configurations.

STILLMAN MASTERMAN.

The Locomotive Engine.—Coal and Feed Water.

The London *Engineer* contains an abstract of a paper recently read before the Institution of Civil Engineers in that city, by D. K. Clark, author of the best work yet published on Railroad Engineering. He stated that with coke, its combustion in the locomotive was practically complete; but with the ordinary class of locomotive boilers it was not so with bituminous coal. He had made experiments in 1850, with coal which only gave two-thirds of the duty of coke. In the beginning of this year, however, he had made other experiments with coal on the locomotive *Canute* on the London and South-Western Railway, which experiments were very satisfactory.—The engine was a passenger one, planned by D. Beattie expressly for burning coal and heating the feed water. The fire-box was furnished with a chamber of fire-bricks, through which the products of combustion passed—this was deposited in a combustion-chamber joining the fire-box and the tubes,—to act as an equalizer of temperature. The hind compartments of the fire-box, also, was arched over with fire-bricks. The heating apparatus was in two parts—the condenser outside, which acted by throwing feed water in jets amongst the exhaust steam—and the super-heater inside the smoke-box, through which the feed water was also passed just before entering the boiler. The cylinders were 15 inches diameter, with a length of stroke 21 inches, driving wheels 6 1-2 feet—fire-grate area 16 square feet—heating surface 769 square feet—and the weight of bricks was 5 3-4 cwt. It was found that in the *Canute* the prevention of smoke was completely attained, with ordinary care and attention; that the evaporative power of the coal was materially improved; and that the heating apparatus was decidedly beneficial.

With the regular express trains the following results were obtained:—Average express train of 10 1-2 carriages, estimated at 66 tuns weight; average speed, including stoppages, 34 miles per hour; water evaporated on duty, 82 cubic feet per hour of the time the steam was on the piston; corresponding consumption of coal, 547 lbs. per hour, and 15 lbs. per train mile; water evaporated per pound of coal, 9·35 lb.; average temperature of feed water, 187° Fah. Special train of 28 carriages, weighing 203 tuns; average speed, 30 3-4 miles per hour; water evaporated as before, 130 cubic feet per hour; coal per hour, 915 lbs., and per train mile 28 3-4 lbs.; water evaporated per pound of coal, 8·87 lbs.; temperature of feed water, 212° Fah. It was argued that, on Beattie's system, an economy of 36 per cent. of coal was effected in comparison with ordinary engines burning coal; and that this system was on a footing of equality with coke-burning engines, in evaporative efficiency of fuel, weight for weight.

He also stated that all the feed water used for locomotive boilers should either be filtered or pure rain water, as hard water reduced the durability of the boiler tubes from nine to two and three years; and besides, hard water caused priming. He also stated that the *link motion* was a sufficient expansion gear, and that its merits were not sufficiently appreciated. With proper arrangements the steam might be cut off at one-fifth the stroke. He also advocated the use of super-heated steam, the perfect protection of the cylinders, and the balancing of the slide valves. The engine, he also asserted, should be perfectly balanced in all its parts. Six-wheeled locomotives with central drivers he thought best secured this end. With suggested improvements, the use of bituminous coal for coke, super-heated steam, protecting the cylinders, balancing the valves, using pure feed water, and heating it, and balancing the engine, he calculated that fifty per cent. of expenses might be saved in working locomotives. This is, certainly, a great amount of proposed saving. Mr. Clark is not a foggie engineer; he has got the real trans-Atlantic spirit of *go-ahead with improvements* in him.

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New Inventions.

Improved Governor.

The economical advantages attained by the use of a governor, in appropriating steam to an engine in proportion to the labor to be performed, aside from the regulation of motion, safety of machinery from the evil effects of sudden changes of speed, &c., are too well understood to need any argument. Such an instrument, in some form or other, has been in general use since the days of Watt.

But while a stationary engine has a very important addition to the governor in the momentum wheel, as a moderator to sudden changes of speed, marine engines are entirely at the mercy of circumstances. These engines being of great power, in proportion to the weight of the paddle wheels, as the latter emerges or immerges in the water, they are ever ready in a rough sea, either to fly away and waste the steam, and alternately stagger for want of power to drive them. This is particularly the case in condensing engines when a low pressure is used, relying upon a vacuum for a portion of the power. Thus, the engine makes a few strokes with great speed, a large volume of steam passes to the condenser, which becomes overheated, when, in a moment, the wheels become submerged, but the engine is poorly provided with steam to meet the resistance. Not so with the application of a proper governor—for, as the wheels rise from the water, and a motion is attained beyond the limited or given speed, the steam is cut wholly off and reserved until the power is again required, when an accumulated force is ready for action, while the condenser having a supply of cool water, large additional facilities are gained for vacuum power. Here it will not be difficult to discover that in rough seas 25 to 50 per cent. of steam must be saved, especially if we include the gain of time. This is saying nothing of the safety of floats or blades, or breaking of shafts or other internal machinery, heating of journals, &c.

In vessels where the propeller is used, much difficulty is experienced. There being one propelling wheel, and it at the end of the ship, it is continually pitched in and out of the water. The result is, that for safety, the general power of the engine must be limited, and an attempt at throttling made by hand. The duration of the passage of the ship, in rough weather. is thus lengthened perhaps 20 to 40 per cent. longer than it would be were the machinery under legitimate mechanical regulation.

Again, in the event of short or cross seas, it is impossible for human foresight to meet he case, even under half pressure of steam, in spite of the most careful attention of the engineer, the engine will sometimes start off in the most dangerous manner.

The engineers of the steamship *Baltic* mention a case in which they were sailing apparently upon a smooth sea, and all force was upon the engine, when in a moment the ship seemed to pass a precipice, the wheels instantaneously emerged, and so quick was the start of the engine, that the oil cups upon the cross-heads, as they descended, left their contents suspended in the atmosphere, made a stroke down and up, meeting the oil in its descent, spattering and splashing it in every direction upon the machinery; it is needless to suggest, in such a case, the danger of breaking a shaft or otherwise damaging the machinery.

The cause of the wrecking of the ill-fated steamer *San Francisco*, and the consequent loss of some hundreds of lives, was founded clearly upon the want of an efficient governor upon the engines that drive the air pump.

Much could be said upon the actual necessity for the safety of a ship upon preventing violent changes in the action of the machinery, but the effect of withholding from the engine steam when not wanted, and letting it upon it with consequent unison of power when demanded, is so palpable, that no intelligent mind can fail immediately to see its value.

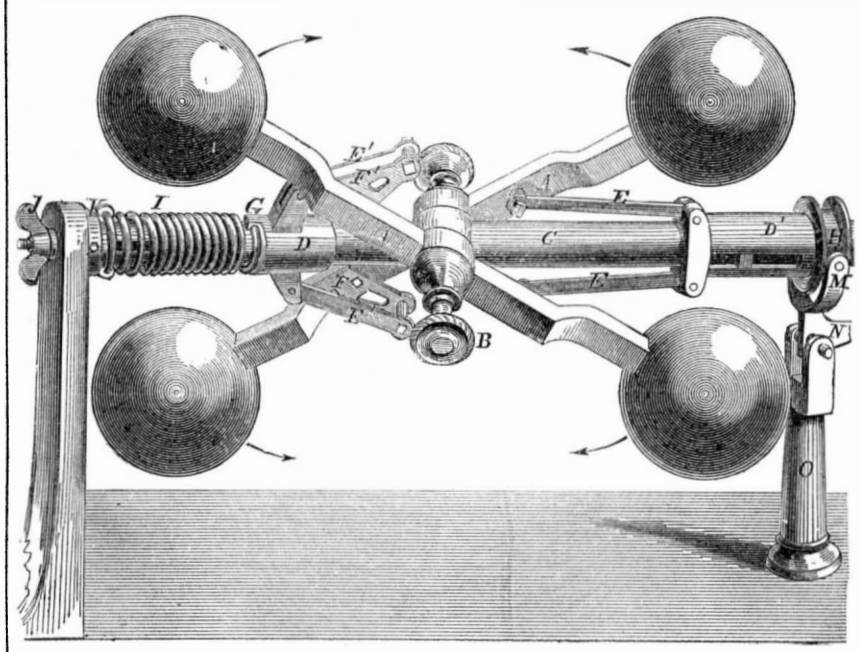
The improvement herewith illustrated forms the subject of a patent granted to Thomas Silver, of Philadelphia, Pa., and adapted as a governor for marine as well as stationary engines. It has been practically tested, both at sea and on land, and its utility established in a very satisfactory manner. A careful examination of its construction will show that its operations must, of necessity, be sure and perfect, under all circumstances.

A A′ are loaded arms pivoted in their centers at B, to the shaft C, which receives motion in any suitable manner from the engine. The arms, A A′, are connected together through the medium of the sliding sleeves, D D′, sleeve D, being united to arms, A A′, by means of rods, E′ E′, and sleeve D′, by means of rods, E E. F F′ are brackets on arms A A′, to which the ends of rods, E′ E, are attached. These brackets are placed at an angle of 45°, so that the line of draft of the arms and rods, when the balls fly out, is always parallel to the shaft C.

When motion is communicated to C by the engine, the balls will have a tendency to fly out in the direction of the arrows, and to move the sleeves, D D′, laterally. Sleeve D′ is furnished with a collar, H, which is grasped by a forked crank, M, pivoted to standard O. The lower branch of the lever, N, is connected with a rod leading to the throttle valve. The connection and operation of sleeve D′, on the throttle valve, is similar to ordinary governors, and requires no particular description.

The ordinary governor consists of a pair of

IMPROVEMENT IN STEAM ENGINE GOVERNORS.



balls attached to arms that swing around a vertical spindle. This arrangement, although it defectively answers for stationary engines, is of no use on steamers, for when the governor spindle is thrown out of a perpendicular position, by the rolling of the vessel, the center of gravity at which the balls hang, no longer remains in line with the governor shaft, but changes with the motion of the vessel. The balls thus act at random on the throttle, so that such a governor is of no benefit whatever, but rather an evil.

But by having double arms and double balls connected as shown in our engraving, the balls counterbalance each other, and cannot move otherwise than in unison with the shaft, C, no matter what is the motion of the vessel.

When a body is set in motion in a given position, or in a given line of motion, it has a tendency to remain in that position. Thus, when the spindle of a common governor revolves rapidly and the balls fly out, they have a tendency to remain extended, and do so remain for a short time, after the speed of the spindle has been reduced. Hence, when the resistance to an engine is suddenly increased to a great extent, the governor does not act with equal suddenness, in opening the throttle, so as to increase the power; a perceptible check in the speed of the engine takes place, but this is recovered as soon as the governor has time to act. This almost stopping and sudden starting, by throwing the load on or off, is familiar to all engineers.

Such objection does not exist in the invention now under discussion. The centrifugal force and tendency of the balls to remain in a given position, is counteracted by the employment of a spiral spring, I, to which the sleeve D is attached by means of clamps, G. The tension of spring H is increased or diminished at pleasure, by turning the nut, J, which moves the claw collar, K, out or in, thus rendering the governor accordingly more or less sensitive, as desired. Collar K terminates in a screw on which nut J moves. Nothing can be more simple and convenient than this method of adjustment.

This governor has been in use for the last six months upon the Collins steamship *Atlantic*, running between New York and Liverpool. Capt. West, chief-engineer Bernard, and the other officers of the vessel, speak in the highest terms of its performances. It is to be placed on all the Collins boats.

The invention is also in use on the large engine employed at the U. S. Mint, Philadelphia, to drive the rolling mills. We are informed that so quick and instantaneous is its operation, that no change in the speed of the engine can be detected, whether the tremendous resistance of the metal, in passing through the rolls, is suddenly involved, or as suddenly ceases.

The proprietors of the Philadelphia *Ledger* newspaper say:—

"We have at present one of Silver's Marine Governors upon a stationary engine, which is used for driving the different printing presses in the Ledger Building. The eight cylinder rotary presses require each between four and five horse power to drive them. This power, which thrown on or off the engine, produces very sudden changes, and, unless the governor is very sensitive, and acts promptly in supplying or shutting off the steam, would derange the other machinery attached to the engine. Silver's Governor has given perfect satisfaction, and has attained its object better than any other which we have tried."

The principles of this instrument are founded upon plain mathematical deductions from the laws of motion, and are adaptable to the regulation of steam engines under all purposes for which they may be used. We regard it as a very valuable and important improvement. We cannot doubt that it will soon come into very general use. Patented in the United States July 3rd, 1855. Also patented in Europe. Address J. W. Harrison, 92 Chestnut street, Philadelphia, Pa., for further information.

Another New Patent Bill.

The Washington correspondent of the New York *Herald* says:—

"The Committee on Patents are preparing, and will report in a short time, a new patent bill, in opposition to the one recently reported in the Senate by Senator James, of Rhode Island. Senator James' bill is considered, by certain of the patent fraternity, too general. The new bill which is being gotten up, has been put into the hands of one of the legal minds of Massachusetts; and when completed is expected to meet the approval and overcome all the obstacles which have heretofore been brought against bills of a similar character.—We can tell better of this, however, when we see the bill

The Committee on Patents have another bill which they intend to report, called the Reciprocity bill. The bill, as I understand it, is one that will apply to foreign patents, or rather, to the Canadas. It appears that there is no reciprocity patent bill between the United States and Canada, except one that operates very unjustly upon our people as well as foreigners; and this bill—the main features of which I have not seen, and of course cannot speak positively with reference to it—will be approved by both countries.

On the Right Track.

We have received a pamphlet setting forth the rules and regulations that are to govern the Annual Fair of the Big Spring Literary Institute, of Newville, Pa. The exhibition takes place on the 12th of August next, and will continue four days. The Agricultural Department is to be a chief feature of the display. In regard to premiums the pamphlet says:—

"As the primary object of the Institute is to advance the cause of literature and science, the Managers have thought this object can be best promoted by offering as premiums books and periodicals of a justly celebrated literary and scientific reputation. Among these the Scientific American is the most popular journal of the kind ever published, and of more importance to the interests of mechanics and inventors than anything they could possibly obtain. To farmers it is also particularly useful, as it will apprise them of all agricultural improvements, &c. It is a weekly journal of eight pages, and a copy of it for one year is truly a valuable premium."

In the language of a modern poet, "them's our sentiments." The Society, in support of their good opinion of the Scientific American, offer a large number of year subscriptions to the paper as premiums. The Big Spring Institute is a model of its kind, and is conducted with great liberality and enterprise. It enjoys a State charter. Lectures are regularly delivered every Thursday evening, from October to April.

Patent Extensions.

Application has been made to the Commissioner of Patents for the extension of William Baker's patent for improved Window Blind Hinge and Fastening, which expires Sept. 17, 1856. The hearing takes place at the Patent Office, Washington, on Sept. 1st, next. Persons opposing the extension are required to file in the Patent Office their objections specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the Office, which will be furnished on application. Address C. Mason, Commissioner of Patents, Washington, D. C.

The extension of Cullen Whipple's patent for Screw Cutting Machines, is also asked Expires August 18th, 1856. Day of hearing August 16th. Objections to be presented in the same manner as above, 20 days before the hearing.

McCormick's Patent Extension again Rejected.

On the 11th inst., in the Senate, the bill for the relief of Cyrus McCormick, to allow him to go before the Commissioner of Patents for a renewal of his patent, was rejected by a majority of nine votes. This extension asked for is that of McCormick's first patent, which has been public property for nine years. It could not be extended now without doing great injury to the community; and had he been granted the privilege of going before the Commissioner again, it is our opinion he would have been summarily refused the extension.

Some of the locomotives on the German railways have their sides, front, and roof made of strong case glass. The plan is a good one.

An acre contains 4,840 square yards; there arn 640 square acres in a square mile.

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Scientific American.

NEW-YORK, JULY 19, 1856.

Ocean Telegraphs and Surveys.

Five years since, when our lines of telegraph were few and feeble, we stated that the time would yet arrive, and was not far distant, when an electric belt would encompass our globe, and the New York merchant would hold converse, by the lightning's flash, with his fellow merchant in London. We did not then conceive, however, that measures would be as soon arranged, as they have, to carry out this grand result. It was then generally supposed that the Atlantic ocean would present too many difficulties for a line of wires to be laid down in it, or to be worked in it by the most powerful batteries if laid down. A line running through the north-west of our continent, then across Behring's Straits, through Northern Asia, and down to Europe was then supposed to be the most feasible route for a world's telegraph.

But this is an age of great enterprise in inventions and works of engineering skill and daring. Any reasonable payable project, however vast, is sure to receive attention, when placed clearly before the public. What was merely suggested a few years ago regarding an ocean telegraph, is now fast growing into a *fixed fact*. Companies have been formed, money subscribed, and measures arranged for the accomplishment of this great undertaking. The work is to be a joint effort between an American company in New York and an English company in London; but the scheme was projected and the first measures taken by the former.

Last year in an attempt to connect our continent with the island of Newfoundland telegraphically, the cable was lost in a storm; but another has arrived from London, and with the precautions to be taken it will soon be laid down successfully, after which we shall be able to receive news from Europe in two days less time than we now do, as the mail steamers will then touch at Newfoundland and leave the news.

But after this is accomplished, the great cable nearly 1,800 miles long has to be laid down. To ensure its success, positive information respecting the bottom of the ocean on which it is to be laid is required, because many parts of the ocean's bed are as steep and rugged as the Rocky Mountains. To lay down a telegraph wire on the bottom of the ocean, a distance of 1,600 miles between the opposing shores, and that bottom interspersed with such submarine mountains and valleys as those represented in the map on page 256, Vol. 9, SCIENTIFIC AMERICAN, would be impracticable, according to the present calculations made by the Ocean Telegraph Companies. It has been asserted that there is an ocean plateau of almost uniform level extending from Newfoundland to Ireland, and that on this marine elevation it would be easy to lay down the cable. This plateau was stated to have been discovered by Lieut. Berryman in the U. S. sloop *Dolphin*, three years ago, when taking deep sea soundings; but that partial survey is not thought to have been sufficient, and at the solicitation of Lieut. Maury and Prof. Bache of the Coast Survey Secretary Dobbin has ordered the exploring steamer *Arctic* (which was sent after Dr. Kane) to be fitted out to take a thorough survey of the entire route projected for the ocean telegraph. This is a noble and commendable act of our government, for which its projectors deserve great credit. The *Arctic* will be commanded by Lieut. Berryman, whose knowledge of his peculiar duties are unequalled; under him will be Lieut. Strain, the heroic explorer of the Isthmus of Darien, and other able officers. She is fully equipped for her work, being provisioned for 90 days, and coaled for 30 full days steaming. She is provided with instruments of every description for taking ocean, atmospheric, and astronomical observations, including a reel of 10,000 fathoms—over 11 miles long—which will be raised by the power of steam, but descend by gravity.

To take the soundings different weights are employed—sometimes leads and sometimes shot of 68 pounds. These are never drawn up again. The shot are slung in a socket, which is attached to the line by hooks in such a way that the moment the shot strikes the bottom it is unshipped, and the line left clear. To haul it up would be impossible.—But through the center of the shot there passes a tube, in which are fixed several quills. These gather up from the bottom specimens of mud, sand, shell, and so forth, to indicate the character of the sounding. Marks upon the line and checks show at a glance the depth to which the weight has descended. These soundings are to be taken every 30 miles over the route, and if the survey furnishes satisfactory results, the laying down of the great telegraph cable across the ocean will be attempted as soon as possible afterwards.

It would be a waste of words to speculate on the probable results of this ocean survey at present. A fine dinner was given in this city last week to commander Berryman, and the officers of the *Arctic*, by Peter Cooper, President, C. W. Field, Esq., and others of the Telegraph Company. She proceeds direct to Newfoundland, to the starting point designed for the telegraph cable, and thence in as straight a line as possible to Ireland. We wish success to this ocean surveying expedition and the Ocean Telegraph Companies.

Important to Patentees, Inventors, and Manufacturers.—Great National Exhibition of Inventions, Machinery, and Productions.

The success which attended the exhibition of the American Institute, at the Crystal Palace, New York, last year, was so complete, that the managers have felt encouraged to make extraordinary exertions for 1856.

They are endeavoring to render the exhibition, this year, a National affair, and their efforts, thus far, have been attended with the highest success. The Crystal Palace, in this city, the largest and most splendid edifice of the kind in the United States, has been again secured, and is now undergoing extensive repairs for the occasion. Letters and circulars announcing the enterprize, inviting co-operation from other Societies, and soliciting Manufacturers of all classes, Mechanics, Inventors, Patentees, Agriculturists, and all who are engaged in any branch of Labor, Art, or Science, to unite and exhibit the best specimens of their respective productions, have been widely circulated. These broad invitations have been responded to in such a cordial and unanimous manner, as to leave no doubt that the forthcoming exhibition will be a magnificent one, exceeding by far any purely American display that has ever occurred in this country.

It promises to equal, almost, in the number, of articles exhibited, the Exhibition of All Nations, which took place, in 1853, under the same roof.

It will embrace a more extensive collection of novelties—new improvements—things of recent origination never before seen, than were ever before gathered together by this Association.

Under these circumstances it is a matter of great importance to inventors, patentees, and manufacturers, to avail themselves of the splendid opportunity which the exhibition offers of bringing their productions before the notice of the public, and we presume they will not be backward in doing so. The arrangements last year, so far as concerned space and power, for the exhibition of machinery were very defective. But this year it is the intention of the Managers to have such difficulties obviated. One half of the entire main floor of the Palace is set apart for moving mechanism, and a large and noble steam engine and boiler, to be employed under the direct supervision of the managers, is now being put in place, together with an abundant supply of shafting. Besides this, there will be a large number of extra engines which may be brought into service, if extra power is required.

We hope that inventors will generally endeavor to compete at this exhibition, and thus render their department complete and creditable. Those who propose to enter the lists should immediately set about the construction of machines. Let there be the greatest display of new inventions ever seen together.

We learn that there is to be quite a change in the system of awarding prizes. The gold medals are to be increased in size, and more care taken to award them only to the most important and best deserving subjects. All the other awards will be more carefully administered than heretofore.

Nearly all of the railroad and transportation companies communicating with New York have agreed to transport articles for the exhibition free of charge one way.

The exhibition opens Sept. 22d, and closes Oct. 25th. A grand cattle show, by the Institute, will take place in Hamilton Square on Oct. 14th, 15th and 16th.

The Secretary and Agent of the Institute is Mr. Wm. B. Leonard, to whom all applications for space, and for circulars, rules, and infortion, should be directed, at the rooms of the Institute, No. 351 Broadway, New York. Mr. Leonard is a thorough mechanic, enterprising, talented, and of sound practical judgment. No man is better qualified for the department of which he takes charge.

Recent American Patents.

Improvement in Looms.—By W. J. Horstmann, of Philadelphia, Pa.—This invention relates to a novel mode of applying and operating the pile wires in looms for weaving piled fabrics, dispensing with the use of pliers. The invention is principally designed to be applied to looms for weaving narrow goods, such as coach lace, trimmings, &c. We have seen specimens of work produced by this invention which were very beautiful.

Improvement in Harvesters.—By C. Wheeler, Jr., of Poplar Ridge, N. Y.—Consists in a peculiar means of operating a reciprocating rake, whereby said rake is made to descend in a horizontal position and rake the cut grain off from one end of the platform with a quick movement, and then ascend and pass back to the opposite end with a moderate movement, during which time the platform is again filled with grain and the rake lowered ready for the succeeding rapid stroke.

Improvement in Melodeons.—By Riley Burditt, of Brattleboro', Vt.—In this improvement the inventor employs a base damper, a device which consists of a flap of similar character to the swell commonly employed in melodeons, applied under or within the swell, to the base or lower octave or octaves, so as to open with the swell or remain closed when the swell is opened, at the pleasure of the player, serving, when closed, to make the lower octave or octaves soft when the upper octaves are in full force. It appears to be a very useful improvement.

Method of Securing Pearl Ornaments into the Handles of Tea and Coffee Pots.—By Chas. Dickinson and William Bellamy, of Newark N. J.—Consists in inserting the pearls in grooves in the molds so that the melted metal will close around thimbles fitted within the pearls, and effectually solder and secure the pearls to the handles. When thus cast the handles are left hollow, and then filled with some non-conductor of heat, such as plaster of Paris. The handles are thus prevented from becoming heated, although the liquid contained in the vessel may be boiling hot.

Stave Machine.—By J. K. Derby, of Jamestown, N. Y.—Consists in jointing the staves, or giving them the necessary bilge, by placing them upon a tilting bed, which is operated by a pattern or guide, so that the stave will be alternately brought into proper relative positions with the saw, to produce the effect desired.

Hat Felting Machine.—By William Fuzzard, of Cambridgeport, Mass.—Consists in attaching an apron to a roller and swinging platform, whereby, upon giving the roller a reciprocating or rocking motion, the apron is moved up and down, and the hat bodies which are placed therein are subjected to the necessary friction or rubbing. A portion of the apron is placed in a reservoir containing water, and the hat bodies or other articles or materials are immersed therein by the apron as it descends, and elevated as the apron ascends.

Bookbinding Machine.—By John C. Coffin, of Westbrook, Me.—This invention is used in the operation known as book backing. It consists in the employment of a follower, clamp, sliding bed, and hammers. The arrangement is such that the leaves are rigidly compressed and then rounded into the form of the book back, by means of concave hammers and a concave follower.

Improvement in Rotary Steam Engines.—By James M. Coleman and Thomas Turton, of Milwaukie, Wis.—Consists in the employment of a rotary piston in combination with oscillating abutment pieces, whereby a smooth and steady movement of the piston is obtained, friction avoided, &c.

Improved Slate Quarrying Machine.—By Charles Frost and A. W. Webster, Waterbury, Conn.—In slate quarrying it is common to drill or cut into the slate rock, so that the slabs of suitable dimensions may be split out. The present improvement is a machine for making the cuts.

It consists in having cutters attached to stocks or blocks, which are pivoted to the side of a rotating wheel and acted upon by a rotating cam and springs, so that the cutters will, as the wheel rotates, cut or chisel a groove into the slate. The wheel is fitted within a frame which slides upon a bar, the frame being fed along on the bar as the work progresses in any proper manner.

Attaching Shafts to Carriages.—By Francis J. Flowers, of Brooklyn, opposite New York City.—Consists in having transverse screw rods permanently attached to the ends of the goose neck, which are attached to the shafts.—Said rods are fitted within metal loops attached to the axle and secured in the loops by nuts and caps.

Smut Machine.—By R. M. Dempsey, of Indianapolis, Ind.—This invention consists in the employment of a corrugated concave head provided with vertical spikes or beaters, and placed within a cylindrical screen and case. The head has wings or fans attached to its under surface. A fan and spouts are so arranged in relation with the above parts that the grain is subjected to the necessary beating, and the smut completely pulverized and blown from the machine.

Improved Brick Machine.—By E. Braman and R. Peterson, of Green Castle, Ind.—In this improvement the molds do not leave the machine, but move back and forth, with a reciprocating motion. The molds are filled from a hopper and pressed by a roller in the ordinary manner. Plungers are arranged to come up and empty the molds by pushing out the forms, and the latter are carried away by another device.

Clock Cases.—By N. Muller, of New York City.—Two designs for ornamental clock cases were patented last week by the above gentleman. They are cast in bronze, and are splendid specimens of artistic skill. Mr. Muller has obtained many patents for designs of this character. He enjoys a wide reputation as a practical artist.

The Engineer.

This is the name of a Scientific and Mechanic journal which has been started in London within the past year. Its general plan of publication is similar to that of the SCIENTIFIC AMERICAN.

The *Engineer* is a most able and valuable paper. It has entirely outstripped its European cotemporaries in point of vigor and enterprise, and appears to be on the high road to success. We are glad of it. We cordially welcome it as a zealous co-laborer in the noble work of diffusing useful knowlege. The *Engineer* is published weekly. It is elegantly illustrated with engravings of new English inventions, and contains, in addition, a large amount of general scientific information.—Those who desire to keep themselves minutely posted up in respect to the progress of British Inventions and Science, should subscribe to the *Engineer*.

A large derrick for hoisting machinery at the dock of Messrs. Merrick & Sons, Philadelphia, fell on the 2d inst., and killed a number of persons who were at the time standing around it.

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Recent Foreign Inventions.

Improvement in Manufacturing Candles.—E. Laporte, of Paris, has obtained a patent for the following improvements in manufacturing candles.

The Invention consists, first, in the employment of a tubular wick, composed of a great many threads, woven, plaited, or otherwise united together; also in the employment of a jacket or case round the molds, capable of being heated from 112° to 132°, by steam: also, in a general process to manufacture a candle, composed wholly of vegetable wax, or having vegetable wax for its base.

The manner of carrying this invention into effect is as follows:—To make two hundred weight of candles, for example, take 66 parts, by weight, of vegetable wax, and 34 parts of tallow, or of cocoanut oil, or other suitable oil, or of any fatty liquid or solid body suitably prepared, and heat the same to about 194°, by means of steam or a water bath. The fatty body is combined with the vegetable wax, for the purpose of rendering the vegetable wax less friable and brittle, and of increasing the intensity of the light. Previous to melting, the wax must be crushed up, and then thrown, together with the tallow or fatty matter, into a vessel containing water, acidulated by sulphuric acid. The melted mixture must be allowed to remain until it becomes sufficiently fluid, when it is drawn off into another vessel, where it is left to get a little cooler,—an even temperature being maintained throughout the mass by keeping it well stirred. The mixture is next run off into molds containing wicks, and heated, as before stated, up to from 112° to 132°; and the temperature is gradually lowered down to from 59 to 67°, when the candles may be removed from the molds. The wicks may be composed of from 60 to 150 threads, woven, plaited, or united in any suitable manner, to form a capillary column, large in bulk, and at the same time very divided and they may be made to burn either so as to require snuffing or not. Vegetable wax, if submitted to too high a temperature, turns black; while if the temperature be not high enough, it curdles, and does not produce a perfect candle.—[Newton's London Jour.

Shades for Lamps and Gas Lights.—H. Gillen, of London, has taken out a patent for making globes and shades composed of prisms of glass. They are strung together, and made to assume the proper form on a frame. By varying the shape of these prisms, very beautiful and novel effects are produced. Some of our lamp shade manufacturers may gain a useful hint from the above.

Preserving Milk.—T. S. Grimwade, London, has received a patent for preserving milk by combining it with sugar and an alkali, and depriving it of its moisture at a low temperature. The milk is placed in a vessel containing hot water at 160° Fah., and reduced to a powder, when it is ready to be put up in packages for use.

Artificial Fuel.—R. R. Cox, London, has obtained a patent for fuel made of equal parts of coal dust, spent tan bark, cow manure, and 4 per cent. of gas coal tar. These ingredients are mixed together molded into blocks, and dried, when it is ready for use. This artificial fuel will burn very well, but its cost cannot be much less than that of common coal.

The Well Bored by Lightning.

In the Scientific American of July 5th I saw an account of a freak of lightning, by which a well was dug in Kensington, N. H. Having seen before substantially the same account, I took the trouble to write to Mr. Titcomb, on whose premises the thing happened, in order to satisfy myself of its truthfulness, and to learn what I could respecting it. The following is a copy in part of his letter:—

"The place where the lightning struck is a valley between two ranges of hills about 150 rods apart; clay soil. Where it struck is plain grass land. Some feet from it are a number of boiling springs, one 10 feet, one 20 feet, and one 35 feet. About four rods distant is a muck meadow, the muck of which, when perfectly dry, is of a strong saltpeter taste, and will float on the surface of water as light as cork. About five rods distant is a current of water flowing from south to north. When the hole made by the lightning was discovered, it was about ten inches in diameter. The persons who found it measured down with a pole about twenty feet, but did not touch bottom. I did not see it till ten days after, when it was filling up, by settling in from the top. Its diameter was then about twenty inches, and its depth fifteen feet, soft bottom. It is now (the date of his letter was June 17th) about ten feet deep. The land around is covered with grass. Not a particle of dirt was found about the hole. The spring about ten feet from it has ever since boiled up water of a whitish color. The hole was full of water when discovered, which is now of a clayey color."

I suppose that the springs mentioned are simply what may be termed brisk springs, not hot water springs.

George F. Walker.

River Side Institute, Auburnsdale, Mass., July 4th, 1856.

[From the accounts we have read of the above spring, and also from the letter of Mr. Titcomb, we have failed to find satisfactory evidence of the spring being the work of a freak of lightning. Some internal and not an external cause may have opened up the new spring; that cause may be the very same as the one that produced the boiling springs in its vicinity; perhaps an explosion of gas.]

The Teredo, or Ship Worm.

The last number of the *U. S. Nautical Magazine* contains a paper on the above subject, by James Jarvis, Esq., read by him before the National Institute at Washington. The introduction to his paper is taken, as he says himself, from various authors—especially Rees and Tredgold. We will pass over this and give his own observations and experience as briefly as possible, as it is worth a thousand times more than all we have found in the old authors referred to.

By order of Commodore Smith, Chief of the Bureau of Yards and Docks, he had been engaged at particular times in a series of experiments since 1849. In order to ascertain the best composition to prevent th ir attacks on wood, it had been his practice to paint a number of blocks and boxes with various compounds,—some he left unprepared, and some partially painted, and sunk them in the Elizabeth river, in April. About the 12th of June the blocks and boxes were generally lifted and examined, but he never had been able to discover any of the animalculæ—young teredo—until about the 20th of June. At this period of the year he generally discovered minute holes in the wood by the use of a magnifying glass. After this, the creature daily *grows ahead*, for it has no powers of locomotion; it grows like an oyster, and has a calcareous or shelly sheathing, which adheres to the surface of its burrow. In Norfolk harbor, Va., they grow from six to 12 inches in length, and from three-eighths to half an inch in diameter. The wood excavated by one twelve inches long, in a season, amounted to more than a cubic inch, if in a solid piece. No signs of the teredo were discovered by him in wood deposited after the 29th of September. In the harbor of New York, Mr. Jarvis supposes that the teredo commences to develope about the first of July, and continue until cold weather arrives; in Charleston, S. C., and further south, they develope during the whole year, whereas, in the colder coasts, such as in the harbors of New England, they do but little injury, because the worm is feeble there, being like a fine thread; it is believed to be a native of the torrid seas. The teredo is not so destructive on piles sunk under water at the New York city docks, as those on the opposite side of the river, on the Jersey and Long Island shores; this is owing, Mr. Jarvis thinks, to the amount of filth carried down in the city sewers. So much for the good offices of dirt. In Boston, and Portsmouth, Me., harbor piles will stand twenty-five years.

Many vessels proceed to sea with parts of their bottoms damaged by these worms, unknown to the captain, owners, or underwriters. One open nail hole in a sheet of copper, will allow the worm access for its excavating work of destruction. A sheet of copper removed from a vessel, will lead to a whole plank being speedily honeycombed.

Mr. Jarvis tried all kinds of wood used in shipbuilding, and he found all attacked.

Mr. Jarvis concludes his paper as follows, and we would invite special attention to his opinions, especially of our friends in San Francisco, the piles of whose harbor have been so rapidly destroyed by this destructive creature.

"If the Hon. Secretary of the Navy would grant me permission to secure the bottoms of ships from the salt-water worm, and from coral deposits, I would put three coats of white zinc paint on the *dry bottoms* of all ships in the Navy, then copper the bottoms; and, to make the whole invulnerable to the worm and to coral deposits, I would put three more coats of white zinc paint on the outside surface of the copper.

To preserve piles, I would drive all I could with the bark on. There is no danger whilst the bark is kept on. The barnacle on *piles* does no injury. Charring is excellent, provided the fissures are well filled with *hot* coal-tar, or some other substance of equal virtue, such as the paints already named. White zinc paint will be found excellent to keep the shell fish from the wood where piles may have the bark broken off before being driven.

I believe that three coats of white zinc paint are next best to copper as a preservative against the ravages of these destructive evil-doers.

In conclusion, I do most earnestly hope that this paper may call the serious attention of naturalists towards investigating the origin of the salt-water worm, to lend their aid in discovering a remedy to keep the animal from developing or *entering* into wood.

Notes on Patented Inventions.—No. 14.

Spruce Beer.—The manufacture of beer has not involved much genius, judging from the small number of patents granted, but some of these are peculiar. In May, 1831, S. Hinds, of Montrose, Pa., received a patent for making a peculiar milk molasses spruce beer, which may be made for a summer drink at no great expense. One pint of molasses, one pint of new milk, and one pint of common hop yeast are put into a six gallon keg, which is then filled with compressed air by means of a pump, and then corked up for twenty-four hours. Two gallons of water are then added, also one quart of molasses, one ounce of ginger, half an ounce of allspice, and half an ounce of the essence of spruce, boiling hot. The whole is now stirred up, the cask filled nearly full of cold water, again stirred, and then corked up for twenty-four hours, when the beer is stated to be fit for use.

In January, 1832, George Jones, of Boston, also secured a patent for making spruce beer. Two pounds of the leaves and sprigs of the white spruce were soaked for three days in strong alcohol, and to every gallon of this extract three pounds of the essential oil of spruce were added, and this was the grand nucleus for making genuine spruce beer in any quantity. To make the beer for use, one ounce of the foregoing extract was placed in a cask with one gallon of molasses, and stirred up will. Two gallons of boiling water were then added, and also stirred, after which the cask (which should be able to contain fifteen gallons) is filled with cold water, and its contents allowed to ferment; after this the beer is fit for use. The first described beer is ap parently the best.

On the same date as the above a patent was issued to Moses Granger, of Lowville, N. Y., for restoring sour ale, beer, and porter. The plan consisted in brewing over again with a mash of fresh malt, the sour or musty ale.

The next patent granted for making beer takes the gilding from the two foregoing. It was issued to Simeon Whiten, Hartford, Conn., in March, 1846, and consisted of ginger, 8 ounces, dried pumpkin, 4 pounds, peanuts or walnuts 1 quart, (shells off,) sweet corn, 1 quart, cream of tartar, 4 ounces, sugar, 10 pounds, essence of pipsissewa, 1 ounce, yeast, 6 gills, water 20 gallons. These were all put into a cask and allowed to ferment, when the beer was ready for use. It makes a transparent beer.

Rhubarb Leaf Segars.—Great numbers of the common kinds of segars now smoked, are stated to be made of dried cabbage leaves steeped in an infusion of tobacco juice made from the coarse stems and broken leaves. But few persons are aware, however, that a patent was actually granted to Wm. D. Groff, of Marietta, Pa., in January, 1838, for making segars of sunflower and rhubarb leaves, either separate or combined, as a substitute for tobacco leaves.

Japanning Leather.—In November, 1838, William Gates, of Hanover, N. Y., received a patent for preparing and applying elastic japan to leather, to produce the kind now known by the name of "glazed leather." Two quarts of linseed oil were boiled until the yellow scum disappeared, and two ounces of umber and one of litharge were added and boiled for an hour and a half. The fire was then withdrawn, and all sediment allowed to settle, after which the clear liquor was run off. Eight ounces of india rubber in shreds were then heated in a close vessel with two quarts of turpentine, and the two quarts of prepared linseed oil described were added, and the whole kept boiling until the india rubber was dissolved, when eight ounces of asphaltum were added. This constituted the japan for the leather. It was put on the leather with a sponge or brush and allowed to dry, which it did rapidly. It was then rubbed down with pumice stone, then another coat laid on, and so in successively, like varnishing and polishing mahogany or rosewood. This method of japanning leather is now public property.

War on the Bed-bugs.—A number of patents have been taken out for destroying these pests. In June, 1829, J. A. Cook, of Georgetown, D. C., was granted a patent for arming the feet of bedposts with tin cups, containing oil or water, to prevent the bugs from ascending by the posts. He called his cups "night angels" in his specification. The same plan is now used extensively in various parts of the country to stand table legs in, to prevent ants, cockroaches, etc., from infesting the edibles thereon.

In June, 1832, B. Overman, of Greensborough, N. C., received a patent for destroying bed bugs by steam. In November, 1833, Thomas Miller, of Newburgh, N. Y., was also granted a patent for destroying them by steam. In May, 1834, J. H. Clark, of Connersville, Ind., was also granted a patent for killing the bugs by steam; and in July following J. Howlet, of Greensborough, N. C., was also granted a patent for steaming out the varmints. But this was not all, for in March, 1836, B. Garrand, of Marysville, Tenn., also secured a patent for a steam kettle to scald the imps, being no less than five patents for dealing death by steam to the bug (terror) by night. All of these patents wese based on immaterial points of the apparatuses employed. Within the past few years such apparatuses have been re-invented by different persons, and brought within the scope of our examination; the plan, we think, is a very good one. Cleanliness and constant watchfulness are the only sure remedies for these tormenters. Their eggs are native in many of the pines and other woods, and they soon bring forth in warm weather No house can escape them in our climate, unless watched and kept aloof by washing, scrubbing and paint. Corrosive sublimate applied to crevices is the best liquid that can be used for killing them. Turpentine and sulphur mixed together is also a good destroyer, and so is sweet oil. Metal bedsteads are the best that can be used, to prevent the nuisance. In hospitals such bedsteads have always been preferred.

Telegraphic Communications.

Professor Giovanni Caselli, of Florence, has just made a discovery which promises to cast all previous contrivances in electro telegraph into the shade. He has invented an apparatus by which the telegraphic wire will transmit to any distance an exact fac simile of any writing or design, when made to communicate with a similar apparatus at the other station. If the account of this extraordinary invention, which we extract from the *Corrier Mercantil*, of Genoa, be true, the transmission of telegraphic dispatches by single letters will be entirely superseded; and the original writing put into the apparatus will be reproduced in an instant, with the signature of the correspondent as if written by himself.—[Galignani's Messenger.

[The above is an old invention. It was practiced several years since in this city, by Bain, the celebrated telegraph inventor.

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TO CORRESPONDENTS.

J. T. T., of N. Y.—The word "sulphuret of zinc" where it occurred in your letter, we considered a slip of the pen, and did not allude to it. The sulphate of zinc could not but be understood to be the substance claimed by Mackie, and meant by us both. The timber preserved at Williamsburgh was by the use of sulphate of copper. The Superintendant brought some specimens to our office, and spoke of no other solution. In Parnell's Chemistry the sulphate of zinc is stated to have been used for years in preventing dry rot in timber.

The inconsistency to which we referred, is that a small portion of sulphuric acid, as stated by you, prevents goods from vulcanizing. We meant that the patent of D. McCurdy for potash combined with sulphur should therefore prevent vulcanization, as such a deliquescent salt, when it comes in contact with the sulphur exposed to heat, will, we think, produce some acid, and a deliquescent sulphide. You know that Mr. Goodyear's patent of 1837, to which we referred, was for the use of acidulous nitrate of copper not the gas binoxyd of nitrogen; and in his patent it is stated that it not merely prevents adhesiveness, but alters the properties of the caout chouc—a curing process is certainly claimed. Prof. Brandes' opinion does not throw the least light on the subject. Can you not give us something yourself on the allotropic character of vulcanized india rubber. We have heard of it being fibrous, as opposed to crystaline india rubber, but such ideas are far too indefinite. Enough has been said about the sulphate of zinc; the sulphate of manganese is held to be allotropic. We are rather skeptical regarding allatropy.

W. C. F. of Me.—We are not acquainted with any positively successful mode of curing stammering. We have heard of some methods that promised success for a short period, and then failed. The discovery of a successful means of removing this defect, would be a great blessing to many like yourself.

H. A. H. of N. Y.—The tar paper to which you allude, and which we have seen, we think would answer your purpose. We could not give you advice respecting the other cement to which you allude.

W. G. B., of Ala.—A horse power is equal to 33,000 lbs applied to the crank, and moving at the rate of one foot per minute.

C. C., of N. Y.—Piesse's work is published by Lindsay & Blakiston, Philadelphia, It is a good work; we do not know its price.

A. W. C., of Vt.—Bain's ground battery for his electric clock was composed of a block of zinc and a pile of mineral charcoal—coke. They were simply buried in the moist earth.

S. W., of Mass.—If you pour a few drops of olive oil into a solution which you suppose contains some copper unseen, and then shake up the solution, it will acquire a greenish shade in the course of a few minutes if the copper is present. This is a very beautiful test for copper, and a very simple one.

H H.. of Me.—Send on your model and the patent fee by express, and we will dispatch your case without delay. There is danger that, by delaying, your application will be opposed by your employers, who can have no legal claims to the fruits of your ingenuity, unless they can prove that they employed you expressly to bring into their service the invention you have made. Many employers are in the habit of thinking themselves entitled to such inventions as are made by their employees, This is not so, unless there are stipulations to this effect, and it is high time for them to abandon such unjust pretensions. If you make your application and secure your patent, you need have no fear of losing it, unless you have previously bargained it away. Inventors should be prompt in securing their patents as soon as possible after the invention is hatched out. The danger is from delay

Messrs. Gregory & Son, of Plattsburg, N. Y., inform us that they wish to purchase some fancy looms for weaving check cassimere and cross-striped satinets.

J. H., of Ind.—The Californian has abandoned the idea of getting one of your machines, as he does not wish to purchase the right of the State to use the invention.

Thomas H. Jones, of Austin, Texas, wishes to purchase a machine for sawing soft building stone. Out of the host of marble sawing machines invented during the past year some of them, undoubtedly, are applicable to this business.

J. R. A., of Mass,—We do not know of any patent on a picture called a Spereotype. If it has been issued within the past year, we recommend you to examine the claims, as they are published in the Sci. Am.

S. H. of N. Y.—Will you oblige us with your full address in order that we may correspond with you. Don't be ashamed to let us know who you are.

J. M., of N. Y.—The only process of plating without a battery is the old fashioned method described in the articles in this volume of the Sci. Am. on Gold and its Uses.

J W. G., of Mo.—The plan you propose of generating steam by injecting water into stame has been experimented with for more than a year past by an inventor in this city, who has applied for a patent on his apparatus In all likehood you will see an account soon of the issuing of his patent. If the plan can be carried out safely it will be an economical one.

J. P., of Va.—The engines of the Pacific were built at the Allaire Works, this city. We do not know the weight of her cylinders.

D. L., of Mass.—We have given you all the information we possess respecting the process for hardening tallow to which you refer.

A. S., of N. H.—The American Artificial Stone Co., 340 Broadway, is the only concern in this city engaged in that particular business. A new application or use of a material already patented could not be considered as the legitimate subject of a patent. The law could not recognize it as an invention.

J. D. B., of Ala.—There are plenty of machines in this section capable of sawing out segments of circles, such as wagon felloes, etc. If you have anything new and useful in this line it could be patented.

E. J. B., of Pa.—You had better send on your model as soon as possible, if you decide to apply for a patent. We are informed that other parties are at work on the same thing. You have already delayed your application too long, and have exposed it imprudently, we fear. The two year's clause is certainly liberal, but inventors who repose beneath its privileges are liable to be outrun by others who pursue the wiser course, and never give up the chase until they have secured their patents or made application for the privilege.

N. T. B., of Ohio.—We will give you an answer next week.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, July 12, 1856 :—

J. H. G. of N. C., $25; J. D. S, of Ohio $30; D. G. of Ill., $30; G. B. C. of N. Y., $25; N. A. of N. Y., $40; W H. D. of N. Y., $30; G. H. of Ill., $60; J. R. A. of N. Y, $27; D. B. E. of Conn., $50; D. C., Jr. of Ala., $30; C. E. G. of Ga., $30; J. D. H. of Ill., $30; St. J. & B. of N. Y., $250; C. R. of O., $40; J. C. G. of Ohio, $35; H. & A. of Mass., $50; T. P. Y. of Ga., $25; E. P. of Conn., $30; M. & B. of N. Y., $30; A. B. of Mass., $30; P. L. & B., of N. Y., $250; A. H., of N. Y., $30; E. D. C. of Mich., $27; S. & M., of Wis. $30; J. L. of Conn. $17; S. B. T. of Conn., $20; J. P. & Co. of Conn. $54; A. & B. N. of N. Y., $25; P. S. of N, Y. $27; G. & G. of L. I. $20; C. W. of Conn. $20; T. G. W. of N. Y. $57; E. H. DeW. of ——, $20; C. Van H., of Mass. $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 12 :—

D. B, of Conn.; E. B, McC. of Iowa; J. H. G. of N. C.; G. B. C. of N. Y.: G. & G. of L. I.; G. R. A, of N. Y.; R. M. H. of N. Y.; T. P. Y. of Ga.; H. & A. of Mass.; E. D. C. of Mich.: N. B. S. of Ind.; J. L. of Conn.; L. B. T. of Conn.; F. & S. of Conn,; A. C. B., of Ct.; A. & B. N. of N. Y.; C. W. of Conn.: N. R. of N. Y.; E. H. DeW. of —— : C. Van H. of Mass.

Important Items.

New Edition of the Patent Laws.—We have delayed for some months the issue of another edition of the present Patent Laws in the expectation that Congress would most certainly, at this Session, make some simple amendments to them—such as are earnestly sought for by inventors and patentees. As there is now little hope that any such changes will be made during the session, we have issued a complete edition of the laws, including the regulations of the Patent Office—copies of which can be had for 12 1-2 cents each. If any of our readers, who have ordered the laws and regulations, and have not received them, they will be promptly supplied upon renewing their requests by letter.

To the Unfortunate—We are no longer able to supply the following back numbers of the present volume Nos. 6, 12, 14, 15, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 34, 35, and 37. Such numbers as we have to furnish, are gratuitously supplied to such subscribers as failed to receive them; and we would take occasion to state, that any person failing to receive their paper regularly, will confer a favor by notifying us of the fact. Missing numbers should be ordered early, to insure their receipt, as an entire edition is often exhausted within ten days after the date of publication.

Models—We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and prevent the liability of their being mislaid.

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An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

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In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

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A NEW AND SCIENTIFIC INVENTION—Dr Cheever's Galvano-Electric Regenerator. Patent Issued Jan. 15th, 1856. A circular relating to the use of the instrument, embracing a general treatise of atony of the spermatic organs, the result of which tends to softening the medullary substance of which the brain is composed may be had gratis, and will be sent to any address by mail by their indicating a desire to receive it. All letters should be directed to DR. J. CHEEVER, No. 1 Tremont Temple, Boston. 42 4*

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NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
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BOILER INCRUSTATIONS PREVENTED—A simple and cheap condenser manufactured by Wm. Burdon, 102 Front st., Brooklyn, will take every particles of lime or salt out of the water, rendering it as pure as Croton, before entering the boiler. Persons in want of such machines will please state what the bore and stroke of the engines are, and what kind of water is to be used. 41 tf

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Science and Art.

Why Photographs taken in Britain are inferior to American Pictures.

It is well known that the American daguerreotypes far surpassed those of the British artists exhibited at the World's Fair, in 1851; and every person who has compared a picture taken in England, with an American one, has been struck with the superiority of the latter. The chemicals used being the same, and the plates, or paper, being prepared in the same manner for both, the cause of the difference has been attributed to the greater brightness of the American sun, and the drier character of our atmosphere. This, it seems, is not the true reason. At a late meeting of the Scottish Photographic Society, held in Glasgow, one of the artists stated that, early in the morning, he was enabled to obtain as beautiful and distinct pictures as could be produced in any country; but when the factories and the busy life of the city, sent up thousands of columns of smoke and heated air, it caused such a vibration of the atmosphere, as affected the rays of light passing through it, and thus produced blurred, indistinct pictures. This appears to be a very philosophic reason for the inferiority of most of the British photographs, daguerreotypes, and ambrotypes, that have found their way into this country.

A Nautical Novelty.

Readers of the SCIENTIFIC AMERICAN will doubtless remember the engraving of "The Bender," or jointed vessel, published by us on page 280, Vol. IX. The inventor proposed to take advantage of the rise and fall of the waves, to propel ships. His plan was to divide vessels into two sections, hinged together. A wire rope passed from the head of the mast on the fore section, to a pulley on the head of another mast, on the aft section, thence down to a fusee on a paddle-wheel shaft. The rise and fall of either section was to operate the wire rope and propel the vessel. The motion of the paddle wheel shaft was to be made continuous by means of springs and fly wheel.

The above plan for a "Bender" appears to have been seized upon and improved, over in England, for we find that a Mr. MacSweeney has patented what he calls a "Jointed Ship," and certain shipbuilders are actually engaged in the construction of a large specimen vessel.

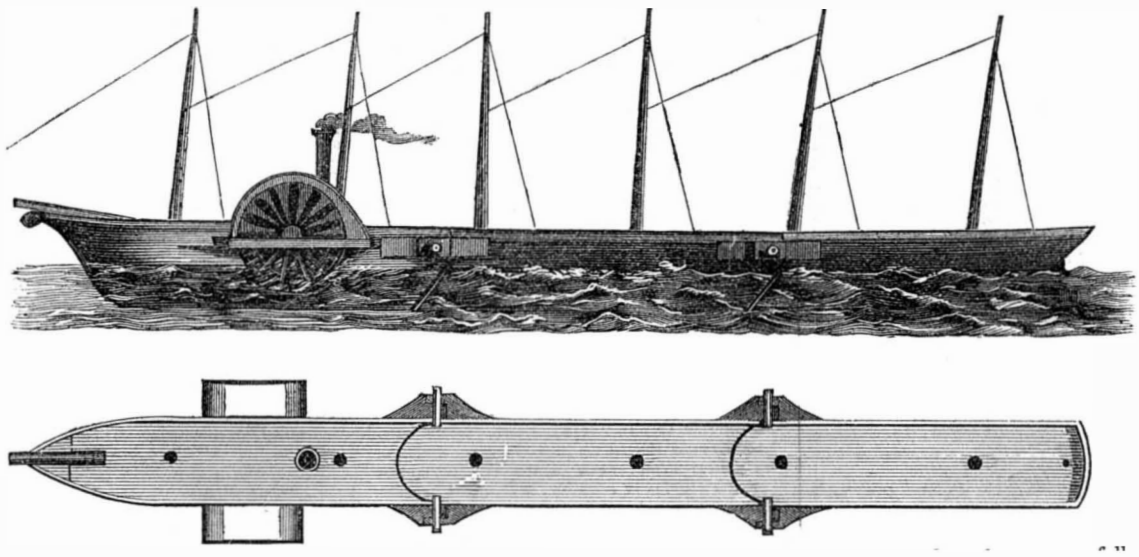
The accompanying engravings and description of Mr. MacSweeney's improvement, are copied from the London *Engineer*. It will be seen that the special object of the patentee is not so much to propel the vessel as to obtain other advantages which he points out. The *Engineer* says:—

"The present system of steam transport by water labors under some disadvantages, from each vessel being a rigid structure, and not admitting of the means of saving a portion of the hull, in case of accident. It is proposed to remedy this defect, by having the ship jointed, as shown in the illustration; only three sections are shown, although a greater number may be used. Each vessel is composed of several sections, jointed each into the other, which admits of their being readily disconnected, and thus affords chances of saving life and part of the hull and cargo in case of accident. The action of the joints is *vertical* only, which enables the jointed ship to rise over the waves instead of going through them. This peculiarity, it is believed by the patentee, will enable it to attain a degree of speed far beyond any hitherto achieved. The joints of all the sections are constructed to one gauge, to admit of the section specially appropriated to the engine and crew being transferred from one set of sections to another.

By this means it is proposed that one engine should suffice to work three sets of sections; one set loading at one port, a second discharging at another port, while a third is performing the voyage between the ports of loading and discharge; thus avoiding the delay and expense now attendant upon the inaction of the crew, and of a costly marine engine, during loading and repairs. The inventor considers that one engine, with its engineering staff and crew, will do the work of three steam vessels, under ordinary circumstances, deducting a short time for repairs of machinery, &c. It is proposed that the jointed ship should be used principally where there is a steady traffic as in the coal trade.

Messrs. M. Pierce & Co., iron ship builders, are now constructing a jointed steam collier of four sections and 1,000 tuns burthen, for the London coal trade. Jointed steam colliers, constructed to bring 1,000 tuns of coal at a trip, in four sections, loading 250 tuns each,

NOVEL JOINTED SHIP.



and drawing 5 feet 6 inches of water, will float over the bars in the north of England at all times of the tide, and shorten the passage, by coming over the shallows at the mouth of the Thames."

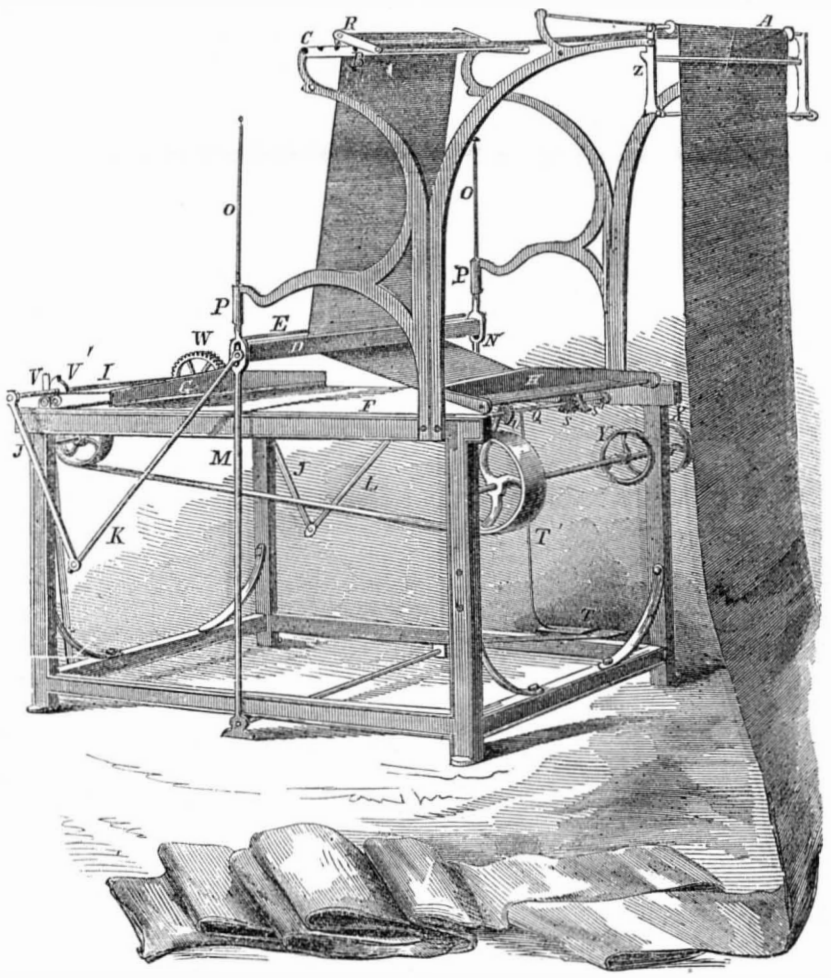
[Sectional canal boats, for the conveyance of coal, have long been successfully used in this country. Let us see how the same plan will work on theocean.

MACHINE FOR FOLDING CLOTH.

Cloth Folding Machine.

The annexed figures represents a machine for measuring and folding cloth, invented and patented Sept. 11, 1855, by J. D. Elliot. A B C are rods over which the cloth is drawn to be folded; D and E are folders or blades between which the cloth passes, and is folded upon the table, F. G and H are jaws which hold the ends of the folds; I is the crank shaft, J and J the cranks. K and L are the pitmans attached to the ends of the blades, H E. M and N are stops to hold the blades. O is a rod attached to one end of the blades and passes through the swivel, P. R is a friction bar or brake, the edge of which falls between the rods, B and C. S is a gear wheel, on a shaft, Q, and S' a segment of a gear attached to the under side of jaw, H. U is a ratchet wheel on shaft, Q. V3 is a lever operated by the cam, V', Extending from lever, V, to ratchet wheel, U, there is a rod attached to a swing dog, playing into the ratchet wheel to lift the jaw, H, when the blade, E, passes under it. W is a gear wheel on the crank shaft, I. X is a tight and loose pulley; Y is a pulley to drive the cloth roll.

The machine operates as follows: the end of the cloth is drawn under the swing friction



frame, Z, and over the rods, A B, under the friction bar, R, and over the rod, C, down and between the folders or blades, D and E, passing the end of the cloth under the jaw, H which is raised by the treddle, T, and rod, T'. When the machine is set in motion, the cranks, J J, the pitmans, K and L, will draw the folders, D E, toward the jaw, G; the rod, O, will slide in the swivel, P, which will turn the folders, D E, so that D will pass under, and E over, the edge of the jaw, G, which is raised by a ratchet, and gears the same as jaw, H. The jaw then falls upon the cloth and folder, D, the cranks withdraw the folder, leaving the fold of cloth under the jaw, G. The folders are lifted from off the table, or cloth folded by the stops, M and N, the rod and swivel turning the blades, and the cranks passing them over to the jaw, H, which raises E, and the fold of cloth passing under, and D, over the edge of the jaw, H, which falls upon the cloth, and E, which is withdrawn, leaving the cloth. As the cloth increases upon the table, F, the ends of the folders slide up in the slots in the ends of the stops, M and N.

To give the cloth more or less friction, place the rod, B, more or less, toward the friction bar, R, especially in sized goods, where they are comparatively damp. The jaws raise only one half of an inch from their starting place, whether that starting place is the table, or from a cut of cloth upon the table, which is enough to receive the folder, and the fold of cloth. This jaw does not fall upon the cloth to crease it or injure the glazing.

This machine is simple, compact, and entirely made of iron. The working parts are light and durable; every motion is positive, and not affected in the least by this difference of speed; thus a positive measure is always insured, the heaviest or the lightest goods glazed or unglazed, or any length of cut, are folded equally well, and without the least alteration in the apparatus.

One of these machines has been running with great success, for a year past, at the Otis Co. Mills, Ware, Mass., on heavy goods. We are informed that it can fold 20,000 yards per diem of ten hours, and is attended by a single boy.

For further information apply to J. D. Elliot Leicester, Mass.

Inventors, and Manufacturers

ELEVENTH YEAR

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